UNIT 1

Lesson One

Attempts of Elements Classification

Worksheet 1

1. A. Choose the correct answer :

1. Mendeleev arranged the elements of similar properties in ....
   a. vertical periods. b. horizontal groups.
   c. vertical groups. d. horizontal periods.
2. Moseley classified elements in his table in an ascending order according to their ....
   a. atomic weights. b. atomic numbers.
   c. chemical activity. d. valencies.
3. The number of elements in Mendeleev's periodic table is .... elements.
   a. 67 b. 76 c. 92 d. 116
4. .... left gaps in his table to be filled with suitable discovered elements in future.
   a. Moseley b. Rutherford c. Bohr d. Mendeleev
5. The scientist .... added the zero group to Mendeleev's periodic table.
   a. Mendeleev b. Rutherford c. Moseley d. Bohr
6. The scientist .... discovered the main energy levels. *(El-Dakahlia 2020)*
   a. Moseley b. Bohr c. Hofmann d. Mendeleev

B. Write the scientific term :

1. A table in which the elements are arranged in an ascending order according to their atomic weights. *(Futures Sch. / Cairo 2020)* (...........................)
2. A table in which the elements are arranged in an ascending order according to their atomic numbers. *(El-Sharkia 2020)* (...........................)
3. They are symbolized by K , L , M , N , O , P and Q letters. (...........................)

2. A. Complete the following statements :

1. Mendeleev discovered that the properties of elements were repeated .... by the beginning of each new ....
2. The atomic number of each element in Moseley's periodic table increases by .... from the preceding element in the same ....
3. Moseley specified a place below the table for .... and .... elements.

(Leaders Lang. Sch. / Cairo 2022)

4. Mendeleev arranged the elements ascendingly according to .... , while Moseley arranged them ascendingly according to .... *(Al Bayan Lang. Sch. / Cairo 2023)*
5. Mendeleev explained his periodic table in his book ....

B. What are the disadvantages of Mendeleev's table ? (Mention two only).

....

....

3. A. To who are these achievements attributed :

1. Corrected the atomic weights of some elements which were estimated wrongly. (........................)
2. Added zero group to the periodic table. (........................)
3. Discovered that the nucleus of the atom contains positively charged protons. *(St. Joseph Sch. / Cairo 2020)* (........................)

B. Put (✓) or (✗), then correct what is wrong :

1. The elements which have similar chemical properties are put in horizontal periods. *(Essmat Sch. / Cairo 2020)*
   (   ) ....
2. Scientists classified the elements in order to facilitate their study.
   (   ) ....
3. Mendeleev had to put more than one element in one cell, as iron, cobalt and nikel.
   (   ) ....
4. Rutherford discovered the main energy levels of the atom.
   (   ) ....

4. A. Give a reason for :

Many attempts are made by scientists for classification of elements.

....

....

B. Correct the underlined words :

1. The elements are arranged in **Mendeleev's table** in an ascending order according to their atomic numbers and the way of filling their energy sublevels with electrons. (........................)
2. The number of energy levels in the heaviest known atoms is **9** levels. (........................)
3. The number of known elements in the modern periodic table till now is **92** elements. *(Manaret Sch. / Cairo 2020)* (........................)

Worksheet 2

1. A. Complete the following statements :

1. The number of elements which exist in nature is ....
2. Elements of s-block are located on the .... of the periodic table and they arranged in .... groups.
3. The period number of the element equals the number of .... occupied by electrons in its atom.
4. The transition elements start from period .... in the modern periodic table.
5. The modern periodic table consists of .... horizontal periods and .... vertical groups. *(Science Inspectorate / Dakahlia 2023)*

B. What is the scientific principle upon which the elements are arranged in the modern periodic table ?

....

....

2. A. Write the scientific term :

1. • A block of elements which is located on the right side of the periodic table.
   • The block which contains the groups from (3A) to (0). (........................)
2. A kind of elements that are located in d-block. (........................)
3. It indicates the number of electrons that revolve in energy levels. (........................)
4. The block which contains the lanthanides and actinides. *(St. Joseph Sch. / Cairo 2020)* (........................)

B. Locate the position of the following elements in the modern periodic table :

1. $_{11}Na$: .... *(Degla Valley Sch. / Cairo 2020)*
2. $_{18}Ar$: .... *(Degla Valley Sch. / Cairo 2020)*
3. $_{20}Ca$: .... *(Akhnaton Sch. / Cairo 2020)*
4. $_{9}F$: ....

C. From the following table :

	Groups							
	1A	2A	3A	4A	5A	6A	7A	0
Second period					Y			
Third period	X							Z

[NB. The letters in the table don't represent the actual symbols of elements]

1. Calculate the atomic number of element (X).

....

2. What is the modern number of the group of the element (Y) ?

....

3. **Complete :** The outermost energy level of element (Z) contains .... electrons.

3. A. Choose the correct answer :

1. Elements of p-block are arranged in .... groups. *(Manaret Sch. / Cairo 2020)*
   a. two b. five c. six d. eight
2. Which of the following elements locates in the third period ? ....
   a. $_{19}K$ b. $_{15}P$ c. $_{6}C$ d. $_{3}Li$
3. All of the following elements are located in group (2A) except ....
   a. $_{4}Be$ b. $_{20}Ca$ c. $_{11}Na$ d. $_{12}Mg$
4. The element that its atomic number equals 17 is similar in its chemical properties to the element that its atomic number equals .... *(El-Santa Zone / El-Gharbia 2023)*
   a. 2 b. 7 c. 9 d. 19
5. The elements which have the same properties locate in the same .... in the periodic table.
   a. period b. group c. nucleus d. energy level
6. The block that contains groups (1A) and (2A) in the periodic table is .... block.
   a. s b. p c. d d. f
7. Which of the following elements locates in the same group in the periodic table ? ....
   a. $_{11}Na, _{6}C$ b. $_{11}Na, _{3}Li$ c. $_{11}Na, _{29}Cu$ d. $_{11}Na, _{10}Ne$
8. An element, its atomic number is (18) , so it is considered as ....
   a. a transition element. b. an inert gas.
   c. a metallic element. d. a halogen.

B. The following table represents a section of the modern periodic table :

$_{3}Z$																	
A												$_{13}D$	Q		M	Y	
						B							T				X

[NB. The letters in the table don't represent the actual symbols of elements]

1. What is the symbol indicates each of the following :
   a. A transition element : ....
   b. An inert gas : ....
   c. An element lies in the third period and group (6A) : ....

2. What is the block of the elements (A), (B) and (D) ?

....

3. **Choose :** The atomic number of element (B) is .... the atomic number of element (T).

a. more than b. equal to c. less than

4. A. Find the atomic number of each of the following :

1. An element exists in period 2 and group (6A).

....

2. An element exists in period 3 and group (1A).

....

3. An element exists in period 2 and group (0).

....

B. Put (✓) or (✗), then correct what is wrong :

1. The modern periodic table consists of three blocks of elements.

( ) ....

2. The period number of the element equals the number of electrons in the outermost energy level in its atom.

( ) ....

3. The atomic number of every element increases by one electron over the element that precedes it in the same period.

( ) ....

C. Give a reason for :

Elements of the same group have similar properties. *(El-Menofia 2020)*

....

UNIT 1

Lesson Two

Graduation of Elements Properties in the Modern Periodic Table

Worksheet 3

1. Complete the following statements :

1. The ability of the atom in covalent molecule to attract the electrons of the chemical bond towards itself, is known as ....
2. A covalent polar compound that is formed of one oxygen atom and two hydrogen atoms, is known as ....
3. The smallest atomic size element is located at the .... of the periodic table, while the largest atomic size element is located at the .... of the periodic table.
4. A covalent polar compound that has lower polarity than water and has three single covalent bonds, is known as ....

2. A. Give reasons for :

1. The atomic size of sodium ($_{11}Na$) is greater than that of magnesium ($_{12}Mg$).

....

....

2. In the same group as we go from up to down, the atomic size increases by increasing the atomic number.

(Science Inspectorate / Ismailia 2022)

....

3. Ammonia (NH_3) is considered as a polar covalent compound.

....

4. Water is much more polar than ammonia. *(El-Sahel Zone / Cairo 2023)*

....

....

B. What happens when ... ?

Increasing the atomic number for elements of the third period [related to : the atomic size].

....

3. A. Compare between :

The group and the period. (concerning the graduation of atomic size property) :

The group	The period
....	....
....	....
....	....
....	....

B. Show the graduation of the atomic size property of elements of the same period by increasing the atomic number. Draw the relationship that shows this graduation.

....

....

4. A. Write the scientific term :

1. The measuring unit of atomic size. *(Science Inspectorate / Behira 2022)* (........................)
2. They are covalent compounds in which the difference in electronegativity between their elements is relatively high. (........................)

B. Put (✓) or (✗), then correct what is wrong :

1. In the same period as we go from left to right, the atomic size decreases by increasing the atomic number.
   (   ) ....
2. Picometre = Part of million of the million part of a centimetre.
   (   ) ....

Worksheet 4

1. A. Write the scientific term :

1. Elements which have less than 4 electrons in their outermost energy level. (........................)
2. An atom of nonmetallic element that gains one electron or more during the chemical reaction. *(Dream Sch. / Giza 2020)* (........................)
3. The strongest nonmetal in group (7A). *(Leaders Sch. / Alexandria 2020)* (........................)

B. Correct the underlined words :

1. The number of electrons in positive ion is **greater** than that of its atom. *(Port Said 2020)* (........................)
2. Each period ends by **a nonmetal element**. *(Manaret Sch. / Cairo 2020)* (........................)
3. The metallic property **decreases** in group (1A) as we go from the top to the bottom. (........................)
4. **Lithium** is the strongest metallic element in group (1A). (........................)

2. Complete the following statements :

1. During chemical reactions, atoms of metals tend to .... electron(s) and change into .... which carry a number of positive charges equals to the number of lost .... *(Leaders Lang. Sch. / Cairo 2022)*
2. Silicon ($_{14}Si$) is a .... element which has the properties of .... and ....
3. By increasing the atomic number within the same period, the metallic property .... , while the nonmetallic property ....
4. The most metallic element in group (1A) is located at the .... of this group, while the least metallic element is located at the .... of the same group.
5. Each period in the modern periodic table starts with .... element.

(St. Joseph Sch. / Cairo 2020)

3. A. Choose the correct answer :

1. All of the following ions have the same electronic configuration of neon ($_{10}Ne$) except ....
   a. Al^{+3} b. Na^{+} c. Li^{+} d. Mg^{+2}
2. An element (X), its atomic number is 15, so the number of electrons in its ion equals ....
   a. 10 b. 15 c. 17 d. 18
3. By increasing the atomic number within the same period, the .... *(Al Bayan Lang. Sch. / Cairo 2023)*
   a. metallic property increases. b. metallic property decreases.
   c. nonmetallic property decreases. d. atomic size increases.
4. An element (Y), its atomic number is 13, so the electronic configuration of its ion is .... *(Sherif Talat Sch. / El-Sharkia 2020)*
   a. 2 , 8 b. 2 , 8 , 3 c. 2 , 8 , 8 d. 2 , 8 , 8 , 3
5. All of the following elements are from semi-metals except ....
   a. tellurium. b. silicon. c. boron. d. bromine.

B. Give a reason for :

Cesium is considered one of the strongest metallic elements. *(St. Joseph Sch. / Cairo 2020)*

....

4. A. What is meant by ... ?

1. Nonmetals : ....

....

2. Positive ion : ....

....

3. Metalloids : .... *(Dream Sch. / Giza 2020)*

....

B. Look at the following figures, then answer the following questions :

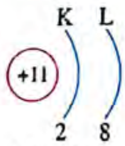


Fig. (A)

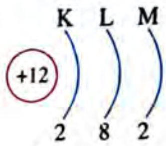


Fig. (B)

1. Which of the previous figures represents :

a. A positive ion : ....

b. A neutral atom : ....

2. Determine the location of the neutral atom in the periodic table :

....

Worksheet 5

1. A. Show by symbolic balanced equations each of the following :

1. Adding dilute HCl to pieces of magnesium. *(East Alex. Directorate / Alex. 2022)*

....

2. Burning a magnesium strip in air, then adding some water.

(El-Manahel Private Lang. Sch. / Sohag 2022)

....

....

3. Burning a piece of coal in air. *(Borg El-Arab Zone. / Cairo 2020)*

....

B. How can you differentiate between copper and potassium :

	Copper	Potassium
By adding each of them to water :	....	....

2. A. What is meant by ... ?

1. Chemical activity series : *(Damietta 2020)*

....

....

2. Acidic oxides :

....

....

B. Choose the correct answer :

1. All of the following elements don't react with dilute HCl, except ....
   a. Cl b. Zn c. S d. C
2. All of the following are related to CO_2 gas, except .... *(Bloom Sch. / Giza 2020)*
   a. it is acidic oxide. b. it is nonmetal oxide.
   c. its solution turns litmus to red. d. its solution turns litmus to blue.
3. Metal oxides are .... oxides.
   a. acidic b. basic c. neutral d. amphoteric
4. Sodium oxide is from .... oxides. *(Al Bayan Lang. Sch. / Cairo 2023)*
   a. amphoteric b. acidic c. nonmetallic d. basic

3. A. Complete the following statements :

1. Some metal oxides dissolve in water forming .... , which turn litmus solution into .... *(Borg El-Arab Zone. / Alexandria 2020)*
2. Sodium reacts with water and .... gas evolves which .... with a .... sound.
3. Both of .... and .... are metals, which react at high temperatures only with hot water vapour.
4. When magnesium oxide dissolves in water, it gives .... , while carbon dioxide dissolves in water giving ....
5. Basic oxides are formed by the reaction of .... with oxygen, while acidic oxides are formed by the reaction of .... with oxygen.

6. $CO_2 + H_2O \longrightarrow$ ....

7. $Zn +$ .... $\xrightarrow{dil.} ZnSO_4 +$ ....

B. Compare between basic oxides and acidic oxides (two points only) :

(Akhnaton Sch. / Cairo 2020)

Basic oxides	Acidic oxides
....	....
....	....
....	....

4. A. $C + O_2 \xrightarrow{\Delta} (a)$

$(a) + H_2O \longrightarrow (b)$

1. Write the name and the chemical formula of each (a) and (b).

....

2. What is the effect of (b) on litmus solution ?

....

B. What happens when ... ?

1. Putting a burning magnesium strip inside a jar filled with oxygen gas.

....

2. Adding drops of violet litmus solution to a cylinder containing a piece of burning coal.

(El Qalyoubia 2020)

....

3. Dissolving magnesium oxide in water. *(Dream Sch. / Giza 2020)*

....

Worksheet 6 on Lessons one & two Unit 1

1. A. Choose the correct answer :

1. Mendeleev arranged elements of similar properties in vertical columns called later as ....
   a. groups. b. periods. c. rows. d. lines.
2. .... explained his periodic table in his book "Principles of Chemistry".
   a. Moseley b. Rutherford c. Bohr d. Mendeleev
3. Helium locates in .... group.
   a. 2A b. 3A c. 4A d. zero

4. Nucleus is positively charged because it contains ....

a. electrons. b. protons. c. neutrons. d. energy levels.

5. .... react very slowly with cold water. *(Damietta 2020)*

a. Ca & Mg b. K & Na c. Zn & Fe d. Cu & Ag

II. Give reasons for :

1. Mendeleev left gaps in his periodic table. *(Akhnaton Sch. / Cairo 2020)*

....

....

2. Sulphur dioxide is considered as an acidic oxide.

....

2. A. Complete the following :

1. The scientist who discovered that the nucleus contains positively charged protons, was ....
2. In the modern periodic table, the largest atom in size is .... atom, and the smallest one is .... atom.
3. Both of .... and .... don't react with water.

B. Locate the position of the following elements in the modern periodic table :

1. ${}_{10}Ne$: .... *(Essmat Sch. / Alexandria 2020)*
2. ${}_{5}B$: ....
3. ${}_{14}Si$: ....
4. ${}_{6}C$: ....

3. A. Put (✓) or (✗), then correct what is wrong :

1. The p-block elements are located in the left side of the periodic table.
( ) ....
2. The f-block contains lanthanides and actinides.
( ) ....
3. Na_2O is an acidic oxide.
( ) ....

B. What happens when ... ?

1. Burning of carbon in oxygen.

....

2. Sodium atom loses one electron during the chemical reaction.

....

4. A. Find the atomic number of each of the following :

1. An element exists in period (4) and group (1A).
....
2. An element exists in period (2) and group (7A).
....
3. An element exists in period (3) and group (5A).
....

B. Give an example for :

1. A polar covalent compound : ....
(Official Lang. Sch. / Giza 2023)
2. A nonmetallic element : ....
3. A metalloid : ....
4. A metal reacts instantly with water : .... *(El-Gharbia 2020)*
5. A metal doesn't react with water : .... *(Dokki Zone / Giza 2023)*
6. A basic oxide : ....
7. An acidic oxide : .... *(El-Dakahlia 2020)*

October Tests

Model 1

Total mark
10

Question 1 — 5 marks

A Choose the correct answer :

1. The elements which occupy the middle block (d) in the periodic table are called .... elements.

   a. transition b. alkali c. acidic d. noble

2. Which of the following is an acidic oxide ? ....

   a. MgO b. CO_2 c. FeO d. CuO

3. The element whose atomic number (18) is ....

   a. transition element. b. inert gas.

   c. metallic element. d. halogen element.

4. Elements of group (7A) are known as ....

   a. inert gases. b. alkali metals. c. halogens. d. metalloids.

B Give a reason for the following :

Elements of group (1A) are known as alkali metals.

....

....

Question 2 — 5 marks

A Put (✓) or (✗) then correct the wrong ones :

1. Water and ammonia are from polar compounds. ( )
2. The modern periodic table is the first real table for classifying elements. ( )
3. Copper and Zinc don't react with water. ( )
4. Cobalt 60 emits gamma rays. ( )

B What happens when ... ?

Adding some water to magnesium oxide with shaking.

....

....

Model 2

Total mark 10

Question 1 5 marks

A Write the scientific term of each of the following :

1. They are nonmetallic oxides which dissolve in water forming acidic solutions. (..........................)
2. It is a table in which the elements are arranged in an ascending order according to their atomic numbers. (..........................)
3. It is the ability of the atom in a covalent molecule to attract the electrons of the chemical bond towards itself. (..........................)
4. It is a part from million of the million part of a metre. (..........................)

B Give a reason for the following :

Mendeleev had to put more than one element in one cell.

....

....

Question 2 5 marks

A Put (✓) or (✗) :

1. Elements of p-black are organized in 5 groups. (   )
2. Alkali metals are monovalent element. (   )
3. The period number of an element equals the number of electrons in the outermost energy level in its atom. (   )
4. Copper and zinc don't react with water. (   )

B On adding a dilute hydrochloric acid to a magnesium ribbon (as shown in the figure), a gas is evolved :

1. Name the gas, how can you identify it ?

....

....

2. Write the balanced symbolic equation which expresses this reaction.

....

....



Test 1

Total mark
10

Question 1

(5 marks)

A Choose the correct answer from a, b, c or d :

1. The modern periodic table consists of .... horizontal periods.
   ⓐ 7 ⓑ 10 ⓒ 14 ⓓ 18
2. The electronic configuration of magnesium ion (Mg^{+2}) is similar to all the following except ....
   ⓐ Na^+ ⓑ $_{10}Ne$ ⓒ Al^{+3} ⓓ $_{18}Ar$
3. The chemical properties of calcium ($_{20}Ca$) are similar to those of ....
   ⓐ $_{19}K$ ⓑ $_{12}Mg$ ⓒ $_{25}Mn$ ⓓ $_{3}Li$
4. Sodium oxide is from .... oxides.
   ⓐ acidic ⓑ basic ⓒ amphoteric ⓓ nonmetal

B Write the balanced chemical equation, which express the following reaction :

Magnesium with dilute hydrochloric acid.

....

Question 2

(5 marks)

A Write the scientific term of each of the following :

1. Covalent compounds, in which the difference in electronegativity between their elements is relatively high. (..........................)
2. The block that contains the groups from (3A) to (0). (..........................)
3. An atom of a nonmetallic element, which gains one electron or more during the chemical reaction. (..........................)
4. It indicates the number of energy levels, which are occupied by electrons in the atom of an element. (..........................)

B Locate the following elements in the modern periodic table :

1. Argon ($_{18}Ar$). 2. Calcium ($_{20}Ca$).

....

....

Test 2

Total mark
10

Question 1

(5 marks)

A Put (✔) or (✗) and correct the worng ones :

1. Some alkalis dissolve in water forming bases. ( )
2. The elements with similar properties have been put in horizontal periods. ( )
3. Metalloids have the properties of metals and nonmetals. ( )
4. An element that is located in period (3) and group (2A), its atomic number is 13. ( )

B Explain the behaviour of the following elements with water :

1. Iron
2. Potassium.

....

....

....

....

Question 2

(5 marks)

A Write the scientific term of each of the following :

1. The nonmetal oxides which dissolve in water forming acidic solutions. (............................)
2. Elements of zero group in the modern periodic table. (............................)
3. A group contains the strongest metals. (............................)
4. The polar compound, which consists of one oxygen atom and two hydrogen atoms. (............................)

B What happens when ... ?

Passing carbon dioxide gas in water.

....

....

Answers of Test 1

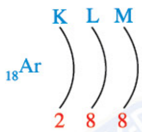
Question 1

A 1 ⓐ 2 ⓓ 3 ⓑ 4 ⓑ

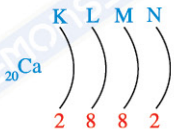
B $Mg + 2HCl \xrightarrow{dil} MgCl_2 + H_2\uparrow$

Question 2

A 1 Polar compounds. 2 P-block.
3 Negative ion. 4 Period number.

B 1 

Period (3)
Group (0) or (18)

2 

Period (4)
Group (2A)

Answers of Test 2

Question 1

A 1 (✗) Some bases .... forming alkalis.
2 (✗) .... put in vertical groups.
3 (✔)
4 (✗) .... is 12

B 1 Iron reacts at high temperatures with hot water vapour.
2 Potassium reacts instantly with water and hydrogen gas evolves which burns with a pop sound.

Question 2

A 1 Acidic oxides. 2 Inert gases. 3 Group (1A). 4 Water.

B It dissolves forming carbonic acid solution
$CO_2 + H_2O \longrightarrow H_2CO_3$

Unit (1) – Lesson (1)

"Attempts of Elements Classification"

1. Mendeleev's periodic table:

He arranged (67) elements in an ascending order according to their atomic weights.

Advantages of Mendeleev's periodic table:

1- He left gaps for discovery of new elements.

2- He corrected wrong atomic weights of some elements.

Disadvantages of Mendeleev's periodic table:

1- He made a disturbance in ascending order of atomic weights of some elements to put them in groups that suit their properties.

2- He had to deal with the isotopes of one element are different elements due to the difference in their atomic weights So he had to put more than one element in one place.

Rutherford: discover the positively charged protons inside the nucleus.

2. Moseley's periodic table:

1- He arranged elements in an ascending order according to their atomic numbers.

2- He added (0) group which includes inert (noble) gases.

3- He specified a place below the table for lanthanides and actinides elements.

Bohr: discovered the main energy levels of the atom (7 in the heaviest atom).

3. Modern periodic table:

- Scientists discovered that each main level contains other levels (energy sublevels).

- Elements are classified in the Modern periodic table according to:

1- Their atomic number.   2- The way of filling the energy sublevels with electrons.

The modern periodic table:

- It consists of (7) horizontal periods – (18) vertical groups.

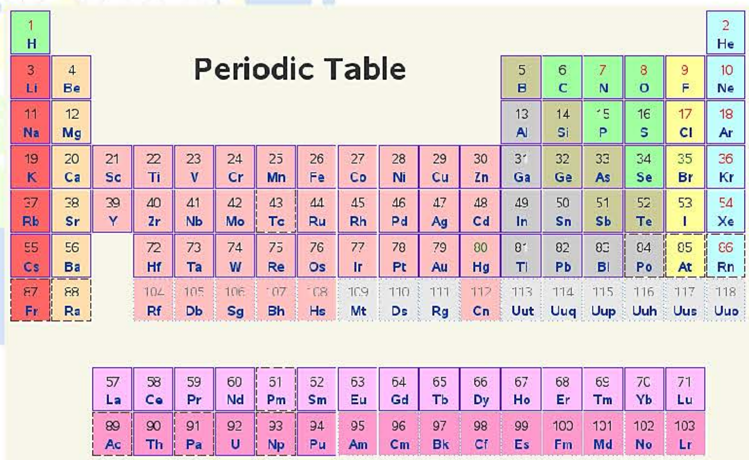
- The number of known elements till now is (118), 92 of them are abundant, while the rest prepared artificially.

- The elements are classified into 4 blocks (s, p, d, f).

Notes:

1- The number of energy levels indicates the period number.

2- The number of electrons in outermost energy level indicates the group number.



- **Elements of the same group are:**

- Similar in chemical properties, because they have the same number of electrons in outermost energy.

- Different in the number of energy levels.

- **Elements of the same period are:**

- Different in chemical properties, because they don't have same number of electrons in outermost energy level.

- Similar in the number of energy levels.

- **Choose the correct answer:**

1- The number of known elements till now is ....

a- 216

b- 118

c- 316

d- 16

2- The scientist .... had discovered the main energy level.

a- Moseley

b- Bohr

c- Hofmann

d- Rutherford

3- The scientist who discovered the positive proton in the nucleus is.............

a- Moseley

b- Bohr

c- Mendeleev

d- Rutherford

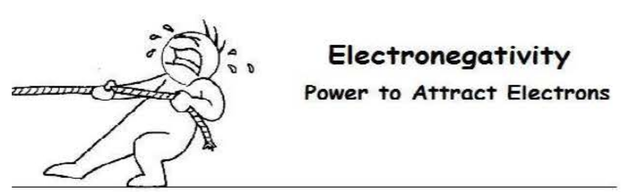
4- The scientist who left gaps in his table is ....

a- Moseley

b- Bohr

c- Mendeleev

d- Rutherford



5- Elements in the P-block are called…………..

a- transition elements.

b- Lanthanides.

c- actinides.

d- noble gases

6- The element which occupy the middle block (d) in the periodic table are called ……………..elements.

a- transition

b- alkali

c- noble gases

d- halogens .

7- The inert gas which has the same electronic structure of sodium ion (Na^+) is…………..

a- $_{10}Ne$

b- $_{2}H$

c- $_{18}Ar$

d- $_{17}Cl$

8- The transition elements starts to appear from the beginning of the ………………………………. period.

a- second

b- third

c- fourth

d- fifth

9- The element which located in period (3) and group (3A) is………..

a- $_{13}Al$

b- $_{5}B$

c- $_{11}Na$

d- $_{15}P$

10- The element that lies in the same period with $_{12}Mg$ is ....

a - $_{7}N$

b- $_{15}P$

c- $_{20}Ca$

d- $_{3}L$

11- Lanthanides and actinides are located in .... block.

a- s

b- p

c- d

d- f

12- An element $_{18}X$ is located in... .... block.

a- s

b- p

c- d

d- f

13- The atomic number of an element that lies in period (4) and group (2A) is..........

a- 4

b- 18

c- 20

d- 10

- **<u>Complete the following:</u>**

1- Mendeleev arranged the element in an ascending order according to..................... , while Mosley arranged them in an ascending order according to ....

2- Mosley located .... And ....elements below his table.

3- ……………………block is located in the middle of the modern periodic table.

4- Element of s-block are located on the ……………………………………. of the periodic table.

5- The modern periodic table consist of ………… horizontal periods and …………..vertical groups.

6- The scientist ………………………………………… discovered the main energy levels.

7- An element **(Z),** its atomic number is 20 , so it locates in group …… and period ……… .

- **Write the scientific term:**

1- Elements of group zero in the modern periodic table. (…………………………………………)

2- They are indicted by the letter K, L, M, N,O (…………………………………………..)

3- The number of electrons rotate in energy levels around the nucleus. (………………………………….)

4- The block which contain group (1A) and (2A) in the periodic table. (……………………………………..)

5- Elements which occupy the middle block (d) in the periodic table. (……………………………………..)

6- It is the number of protons inside the nucleus. (……………………………………..)

7- A scientist that arranged the elements in an ascending order according to their atomic number. (…………………. ……………………….)

- **Correct the underlined words:**

1- **Mendeleev** discovered that the nucleus of the atom is positively charged.

2- **Rutherford** discovered the main energy levels.

3- Moseley put lanthanides and actinides **on the left side of the periodic table.**

4- **Moseley** arranged the elements ascending according to their atomic weight.

- **Locate the position of an element that its atomic no. is 17 , then:**

- find the atomic number of the element above it in the same group.

……………………………………………………………………………

-write the name of the group in which both of them are present.

……………………………………………………………………………

- **Write down the electronic configuration of the following elements then mention their group number and period number.**

- $_{9}F$ $_{19}K$ $_{10}Ne$ $_{15}P$ $_{17}Cl$ $_{20}Ca$ $_{2}He$

	electronic configuration	their group no	their period no
$_{9}F$			
$_{19}K$			
$_{10}Ne$			
$_{15}P$			
$_{17}Cl$			
$_{20}Ca$			
$_{2}He$			

Lesson (2)

"Graduation of the properties of elements in the Modern periodic table"

- The properties of elements in the Modern periodic table:

- Atomic size. - Electronegativity. - Metallic and none-metallic properties.

- **Atomic size:** The atomic radius is used to measure Atomic size and its measuring unit is picometre
- **Electronegativity:** It's the ability of the atom in covalent molecule to attract the electrons of the chemical bond towards itself.
- **Metals:** They are the elements which have less than four electrons in their outermost energy levels.
- **Positive ion:** Is an atom of metallic element losing an electron or more during the chemical reaction.
- **Nonmetals:** They are elements which have more than 4 electrons in their outermost energy levels.
- **Negative ion:** Is an atom of nonmetallic element gaining an electron or more during chemical reaction.
- **Metalloids:** They are elements which have the properties of both metals and nonmetals.

Notes:

1- The atomic size of an element decreases in periods.

- Due to the increase of the attraction force between the positive nucleus and outermost electrons.

2- The atomic size of an element Increases in groups.

- Due to the increase of the number of energy levels and decrease of attraction force.

3- Metals tend to lose the outermost electrons and changes into positive ion.

4- The electronic configuration of (Na^+), (Mg^{+2}) and (Al^{+3}) is similar to the nearest inert gas (Ne_{10}).

5- Basic oxides: They are metallic oxides, some of them dissolve in water giving alkaline solutions. Their solutions (alkalis) turn litmus solution into blue.

6- **Acidic oxides:** They are nonmetal oxides, some of them dissolve in water giving acids. Their solutions (acids) turn litmus solution into red.

7- **The chemical properties of metals :**

1-Some metals react with dilute acids forming salt of acid and hydrogen gas

$$Mg + 2HCl \longrightarrow MgCl_2 + H_2\uparrow$$

Magnesium + Hydrochloric acid ⟶ Magnesium chloride+ Hydrogen

2-Metals react with oxygen forming metallic oxides which are known as basic oxides.

$$2Mg + O_2 \longrightarrow 2\,MgO$$

Magnesium + Oxygen ⟶ Magnesium oxide

3- Basic oxides which dissolve in water form alkalis:

$$MgO + H_2O \longrightarrow Mg(OH)_2$$

Magnesium oxide + Water ⟶ Magnesium hydroxide

- (K) Potassium and (Na) Sodium React instantly with water and H_2 evolves.
- (Ca) Calcium and (Mg) Magnesium React very slowly with cold water.
- (Zn) Zinc and (Fe) Iron React in high temperature with only hot water vapour.
- (Cu) Copper and (Ag) Silver Don't react with water.

8- **The chemical properties of nonmetals :**

1- Nonmetals don't react with the acids.

2 Nonmetals react with oxygen forming non-metal oxides. Most of them are known as acidic oxides.

$$C + O_2 \longrightarrow CO_2$$

Carbon + Oxygen ⟶ Carbon dioxide

3-The nonmetal oxide dissolves in water forming acids.

$$CO_2 + H_2O \longrightarrow H_2CO_3$$

Carbon dioxide + Water ⟶ Carbonic acid.

• Choose the correct answer:

1- Each period in the periodic table starts with a/an ....Element.

a- Semi-metallic

b- inert gas

c- non metallic

d- metallic.

2- When sodium reacts with water , ...gas evolves.

a- Co_2

b- H_2

c- O_2

d- d- N_2

3- Burning of carbon in the air produce................

a- CO

b- CO_2

c- CaO

d- C

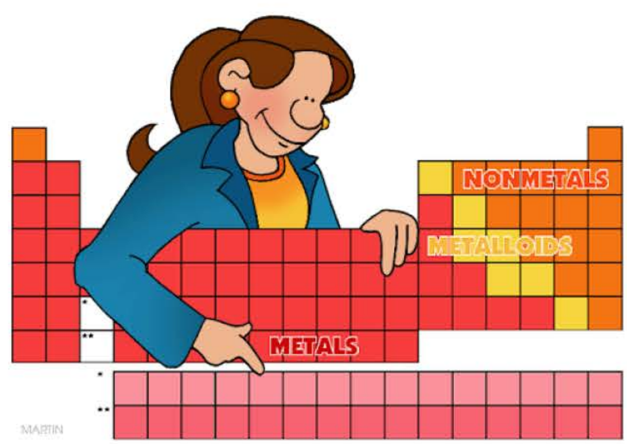
4- Which of the following is a metalloid?...................

a- sodium

b- iron

c- silicon

d- fluorine



5- The strongest metal lies in group ....

a- (0) group

b- (1A)

c- (1B)

d- (7A)

6- Metal oxides are ………………………. oxides.

a. basic
b. acidic
c. neutral.
d. normal

- **Put (√) or (x) :**

1- The metallic property in group (1A) increases as we go from up to down. (…………)

2- Metallic property of the same group increases by the increase of the atomic number. (……….)

3- The atomic size increases in the same group by increasing the atomicnumber. (…………..)

4- Solutions of nonmetal oxides turn the violet litmus solution into red. (…………)

3- Water and ammonia are from polar compound. (………….)

- **Complete the following:**

1- During the chemical reaction, metal atom tends to ……………………… electrons and changes into ……………………ion.

2- In the group , by increasing the atomic number , the atomic size…………………… .

3- As the atomic number increases in the same period, the nonmetallic property…………………….

4- Each period in the modern periodic table starts with………………………………. element and ends with ………………….elements.

5- The elements that have the properties of metals and nonmetal are called…………..

6- Sodium oxide is from …………………. Oxides, while carbon oxide is from……………………………Oxides.

7- nonmetals Oxides dissolve in water giving ……………………………. which turn the litmus solution into ……………………..

8- Metals are arranged in ………………… order according to their……………….in the chemical activity series.

9- Sodium oxides is from …………………………oxides.

10- $MgO + H_2O \longrightarrow$ …………………………………….

11- Magnesium reacts with hydrochloric acid giving …………………and…………………

12- The measuring unit of atomic size of atom is…………………………

- **Write the scientific term:**

1- It is the measuring unit of the atomic size of element. (………………………………)

2- A kind of elements in which their valence electrons contain more than 4 electrons. (………………………)

3- A kind of elements in which their outermost energy level contains less than 4 electrons. (…………………………)

4- Elements react with oxygen forming acidic oxides. (…………………………)

5- An atom of metallic element which loses one electron or more during the chemical reaction.(………………)

6- The substances which have some properties of metals and some properties of nonmetals(…………………)

7- A group contains the strongest nonmetal. (…………………………)

8- The ability of the atom in the covalent molecule to attract the chemical bond electrons to it. (………………………………)

9- Elements which have the properties of metals and nonmetals. (……………………………………)

10- A series in which metals are arranged in a descending order according to their chemical activity (………………………………………)

11- Elements react with oxygen forming acidic oxides. (…………………………)

12- The oxides that turn litmus paper into red. (…………………………)

- ## Give reason for:

1- In periods by increasing the atomic number, the atomic size decrease.

……………………………………………………………………………………………

2- Sodium is kept under kerosene surface.

……………………………………………………………………………………………

3- Atomic size increase from up to down in the group.

……………………………………………………………………………………………

- ## Write the balance chemical equations for the following :

1- Reaction of magnesium with diluted hydrochloric acid.

……………………………………………………………………………………………

2- Reaction of carbon dioxide with water.

……………………………………………………………………………………………

3- Reaction of magnesium oxide with water.

……………………………………………………………………………………………

4- Burning magnesium in oxygen.

……………………………………………………………………………………………

5- Reaction of copper with hydrochloric acid.

……………………………………………………………………………………………

- ## How can you differentiate between each of the following?

- Coal and magnesium, (using HCl)

  ……………………………………………………………………………………………

  ……………………………………………………………………………………………

- Calcium oxide solution and sulphur trioxide solution.
- ……………………………………………………………………………………………
- ……………………………………………………………………………………………

- **Compare between**

1. Basic oxides and acidic oxides:

basic oxides	acidic oxides

2. Metals and nonmetals:

Metals	nonmetals





Science Department

Revision Sheets For 2nd prep.
Unit 1 (Lesson 1 and 2)



Write the scientific term:

1. The table in which elements are arranged according to their atomic weights.
2. The table in which elements are arranged according to their atomic numbers.
3. The table in which elements are arranged according to the atomic number and the way of filling the energy sublevels with electrons.
4. • A group of elements found in the middle of the periodic table and includes ten vertical columns.
5. Elements of group zero in the modern periodic table.
6. • Elements of "f block in the modern periodic table.
7. • A part from a million of million part of metre.
   • The measuring unit of atomic radius which is used as a measure for the atomic size.
8. The ability of the atom in covalent molecule to attract the electrons of the bond towards itself.
9. Covalent compounds in which the difference in electronegativity between their elements is relatively high.
10. The polar compound which consists of one oxygen atom and two hydrogen atoms.
11. • Elements which have less than four electrons in their outermost energy level.
12. An atom of metallic element which loses one electron or more during the chemical reaction.
13. • Elements which have more than four electrons in their outermost energy level.
14. An atom of non-metallic element which gains one electron or more during the chemical reaction.
15. The gas which is evolved on adding dilute hydrochloric acid to a piece of magnesium.
16. A solution used to differentiate between acids and bases.
17. Oxides which dissolve in water producing alkalis.
18. • Substances which turn the litmus solution into blue.
    • Substances resulted from dissolving of metal oxides in water.
19. • A series in which metals are arranged in a descending order according to their chemical activity.
20. The gas which is produced on burning a piece of coal.

21. The acid which is produced on dissolving carbon dioxide in water.
22. • Substances resulted from dissolving of non-metal oxides in water.

Locate the position of the following elements in the modern periodic table:

1-($_2$He).

2-($_{17}$Cl).

3- ($_{18}$Ar).

4- ($_{20}$Ca).

Calculate the atomic numbers of the following elements :

1. An element is located in the 1st period and group (1 A).
   ....
2. An element is located in the 2nd period and group zero.
   ....
3. An element is located in the 3rd period and group (2A).
   ....

Give reason:

1-Mendeelev left gaps in his periodic table.
....

2-Elements of the same group have similar properties.

- Both sodium ($_{11}$Na) and potassium ($_{19}$k) are located in the same group.

....

4-Both Lithium ($_3$Li) and nitrogen ($_7$N) are located in the same period
....

5- The atomic size increases in groups .
....

6- The atomic size of ($_{11}$Na) is greater than that of ($_3$Li)
....

7-Water molecule is from the polar molecules.
....

8-Solution of magnesium oxide in water turns the violet litmus solution into blue.

....

9-Solution of carbon dioxide in water turns the violet litmus solution into red.

....

Complete:

1. The most important attempts to classify elements are ………………………, ……………………… and……………………… tables.
2. Mendeleev discovered that the properties of elements were repeated ……………………… by the beginning of each………………………
3. One of the advantages of Mendeleev's table is correcting the wrongly estimated……………………… of some elements.
4. Mendeleev arranged the elements according to ....while Moseley arranged them according to… …………..........
5. The scientist.................. discovered that the nucleus of the atom contains protons.
6. Moseley discovered after studying .... rays properties that the periodic properties of elements are related to their .... and not to their..... ....
7. Moseley located .... and .... elements below his table.
8. The scientist.......... had discovered the main energy levels of the atom .
9. In the modern periodic table, elements are arranged according to .... and ....
10. The number of known elements till now is .... elements, where .... elements are found in the nature.
11. The modern periodic table consists of .... horizontal periods and.......... vertical groups.
12. Elements of S-block are located on the .... side of the periodic table and they are arranged in two groups which are .... and..........
13. Elements of p-block are located on the .... side of the periodic table and they are arranged in .... groups.
14. The number of a period indicates………….while the number of a group indicates…………
15. An element its atomic number is 13,so it is located in the……………group and……..period
16. ………………… is used as a measure for atomic size of an atom and its measuring unit is..........
17. By increasing the atomic number within a period, the atomic size .... because the ....between positive nucleus and outermost electrons increases.

18. By increasing the atomic number in groups, the atomic size .... due to the increase of the number of..........

19. The atomic size of magnesium ($_{12}Mg$) atom is .... than that of beryllium ($_{4}Be$) atom as the .... of magnesium atom is greater than that of beryllium atom.

20. The outermost energy level of metals contains .... 4 electrons, while that of .... contains more than 4 electrons.

21. During the chemical reaction, metal atom tends to .... electrons and changes into..........

22. During the chemical reaction, magnesium ($_{12}Mg$) atom loses .... electrons and changes into .... ion .

23. ....have the properties of both metals and non-metals.

24. By increasing the atomic number within a period, the metallic property………… while the non-metallic property.................

25. Each period starts with strong .... and ends by................

26. Magnesium reacts with oxygen giving .... which is called .... oxide.

27. Some basic oxides dissolve in water giving .... which turn the litmus solution into...................

28. Metals are arranged in a .... order according to their .... in chemical activity series.

29. …………………… metal reacts instantly with water and .... gas evolves which burns with .... sound.

30. …………………… metal reacts with hot water vapour, while .... metal doesn't react with water.

31. Metal oxides are called .... oxides, while non-metal oxides are called .... oxides.

32. Non-metals react with oxygen giving .... which are known as ....

33. Non-metal oxides dissolve in water giving .... which turn the litmus solution into.................

34. Burning a piece of carbon in air produces .... which dissolves in water giving ....

Write the balanced chemical equations which express the following reactions:

1-Burning a magnesium strip in oxygen.

....

2-Magnesium with dilute hydrochloric acid.

....

3-Burning a piece of coal in air.

....

4-Carbon dioxide with water.

....

5-Dissolving of magnesium oxide in water.

....



Good luck & Have fun ☺

FUTURES EDUCATIONAL SYSTEMS

Science Department



Revision Sheets For 2nd prep.

Unit 1 (Lesson 1 and 2)

Write the scientific term:

1. The table in which elements are arranged according to their atomic weights. **(Mendeleev periodic table)**
2. The table in which elements are arranged according to their atomic numbers. **(Mosley periodic table)**
3. The table in which elements are arranged according to the atomic number and the way of filling the energy sublevels with electrons. **(Modern periodic table)**
4. • A group of elements found in the middle of the periodic table and includes ten vertical columns. **(Transitional elements)**
5. Elements of group zero in the modern periodic table. **(inert gases)**
6. • Elements of "f block in the modern periodic table. **(Actinides and Lanthanides)**
7. • A part from a million of million part of meter. **(Pico meter)**
   • The measuring unit of atomic radius which is used as a measure for the atomic size.
8. The ability of the atom in covalent molecule to attract the electrons of the bond towards itself. **(Electronegativity)**
9. Covalent compounds in which the difference in electronegativity between their elements is relatively high. **(Polar compounds)**
10. The polar compound which consists of one oxygen atom and two hydrogen atoms. **(Water)**
11. • Elements which have less than four electrons in their outermost energy level. **(Metals)**
12. An atom of metallic element which loses one electron or more during the chemical reaction. **(Positive ion)**
13. • Elements which have more than four electrons in their outermost energy level. **(Non-metals)**
14. An atom of non-metallic element which gains one electron or more during the chemical reaction. **(Negative ion)**

15. The gas which is evolved on adding dilute hydrochloric acid to a piece of magnesium. **(Hydrogen gas)**

16. A solution used to differentiate between acids and bases. **(Litmus solution)**

17. Oxides which dissolve in water producing alkalis. **(Metallic oxides)**

18. • Substances which turn the litmus solution into blue. **(basic oxides)**
    • Substances resulted from dissolving of metal oxides in water.

19. • A series in which metals are arranged in a descending order according to their chemical activity. **(Chemical activity series)**

20. The gas which is produced on burning a piece of coal. **(CO_2 gas)**

21. The acid which is produced on dissolving carbon dioxide in water.

(Carbonic acid)

22. • Substances resulted from dissolving of non-metal oxides in water.

(Acidic oxides)

Locate the position of the following elements in the modern periodic table:

1-($_2$He). **He) 2** **Group 1A** **period 1**

2-($_{17}$Cl). **Cl))) 2 8 7** **Group 7A** **period 3**

3- ($_{18}$Ar). **Ar))) 2 8 8** **Group zero** **Period 3**

4- ($_{20}$Ca). **Ca)))) 2 8 8 2** **Group 2A** **Period 4**

Calculate the atomic numbers of the following elements :

1. An element is located in the 1st period and group (1 A).
   Atomic number = 1
2. An element is located in the 2nd period and group zero.
   Atomic number = 10
3. An element is located in the 3rd period and group (2A).
   Atomic number = 12

Give reason:

1-Mendeelev left gaps in his periodic table.

Because he predicted the discovery of new elements& determined the values of their atomic weights.

2-Elements of the same group have similar properties.

- Both sodium ($_{11}$Na) and potassium ($_{19}$k) are located in the same group.

Because they have the same number of electrons in outermost energy levels.

4-Both Lithium ($_3$Li) and nitrogen ($_7$N) are located in the same period

Because they have the same number of energy levels.

5- The atomic size increases in groups .

Due to increase number of energy levels.

6- The atomic size of ($_{11}$Na) is greater than that of ($_3$Li)

Because number of energy levels in Sodium is more than that of Lithium.

7-Water molecule is from the polar molecules.

Because the difference in electronegativity between its elements is relatively high.

8-Solution of magnesium oxide in water turns the violet litmus solution into blue.
Because MgO is basic oxide that dissolves in water forming alkaline solution that turns litmus solution into blue

9-Solution of carbon dioxide in water turns the violet litmus solution into red.
Because CO_2 is acidic oxide that dissolves in water forming acidic solution that turns litmus solution into red

Complete:

1. The most important attempts to classify elements are **Mendeleev**, **Mosley** and **modern periodic** tables.
2. Mendeleev discovered that the properties of elements were repeated **periodically** by the beginning of each **period**
3. One of the advantages of Mendeleev's table is correcting the wrongly estimated **atomic weight** of some elements.
4. Mendeleev arranged the elements according to **atomic weight** while Moseley arranged them according to **atomic number**
5. The scientist. **Rutherford** discovered that the nucleus of the atom contains protons.
6. Moseley discovered after studying **X** rays properties that the periodic properties of elements are related to their atomic number and not to their atomic weight
7. Moseley located **Actinides** and **Lanthanides** elements below his table.
8. The scientist **Bohr** had discovered the main energy levels of the atom .
9. In the modern periodic table, elements are arranged according to **atomic** number and **Way of filling of energy levels**
10. The number of known elements till now is **118** elements, where **92** elements are found in the nature.
11. The modern periodic table consists of **7** horizontal periods and **18** vertical groups.
12. Elements of S-block are located on the **right** side of the periodic table and they are arranged in two groups which are **1A** and **2A**
13. Elements of p-block are located on the **right** side of the periodic table and they are arranged in **6** groups.
14. The number of a period indicates **the number of energy levels** while the number of a group indicates **number of electrons in outermost energy level**
15. An element its atomic number is 13, so it is located in the **3A** group and **3rd** period
16. **Atomic radius** is used as a measure for atomic size of an atom and its measuring unit Is **picometer.**
17. By increasing the atomic number within a period, the atomic size **decreases** because the **Attraction forces** between positive nucleus and outermost electrons increases.

18. By increasing the atomic number in groups, the atomic size **increases** due to the increase of the number of **energy levels.**
19. The atomic size of magnesium ($_{12}$Mg) atom is **larger** than that of beryllium ($_{4}$Be) atom As the **number of energy levels** of magnesium atom is greater than that of beryllium atom.
20. The outermost energy level of metals contains **less than** 4 electrons, while that of **Non-metals** contains more than 4 electrons.
21. During the chemical reaction, metal atom tends to **lose** electrons and changes Into **positive ion.**
22. During the chemical reaction, magnesium ($_{12}$Mg) atom loses **two** electrons and changes Into **positive** ion .
23. **Metalloids (or semi-metals)** have the properties of both metals and non-metals.
24. By increasing the atomic number within a period, the metallic property **decreases** while the non-metallic property **increases.**
25. Each period starts with strong **metal** and ends by **inert gas.**
26. Magnesium reacts with oxygen giving **magnesium oxide** which is called **basic** oxide.
27. Some basic oxides dissolve in water giving **alkalies** which turn the litmus solution Into **blue.**
28. Metals are arranged in a **descending** order according to their **chemical activity** in chemical activity series.
29. **Na and K** metal reacts instantly with water and **Hydrogen** gas evolves which burns with **pop** sound.
30. **Iron and Zinc** metal reacts with hot water vapor, while **copper and silver** metal doesn't react with water.
31. Metal oxides are called **basic** oxides, while non-metal oxides are called **Acidic** oxides.
32. Non-metals react with oxygen giving **non-metal oxides** which are known as **Acidic oxides.**
33. Non-metal oxides dissolve in water giving **acidic solutions** which turn the litmus solution Into **red**
34. Burning a piece of carbon in air produces **CO_2**which dissolves in water giving **Carbonic acid**

Write the balanced chemical equations which express the following reactions:

1-Burning a magnesium strip in oxygen.

$2Mg + O_2 \xrightarrow{\Delta} 2\,MgO$

2-Magnesium with dilute hydrochloric acid.

$Mg + 2HCl \xrightarrow{\text{diluted}} MgCl_2 + H_2$

3-Burning a piece of coal in air.

$C + O_2 \xrightarrow{\Delta} CO_2$

4-Carbon dioxide with water.

$CO_2 + H_2O \longrightarrow H_2CO_3$ (carbonic acid)

5-Dissolving of magnesium oxide in water.

$MgO + H_2O \longrightarrow Mg(OH)_2 + H_2$



Good luck & Have fun ☺



October Revision

Mr. Ahmed Elbasha

(1) Write the scientific term :

1) The ability of the atom in a covalent molecule to attract the electrons of the chemical bond towards itself. ....

2) The halogen which exists in a liquid state. ....

3) It is a series in which metals are arranged in a descending order according to their chemical activity. ....

4) Metals are arranged according to their chemical activity. ....

5) The apparatus which is used in water electrolysis. ....

6) A bond that exists between water molecules. ....

7) The horizontal rows in the modem periodic table. ....

8) The gas which is collected at the cathode in water electrolysis. ....

9) A liquid metal acts as a heat conductor in nuclear reactors for generating electricity. ....

10) The kind of bond which binds oxygen atom with hydrogen atom in water molecule. ....

11) The strongest metal in group (1A) . ...

12) The elements that occupy the middle block (d) in the periodic table. ....

13) Elements where their valency shell contains more than four electrons. ....

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14)	A molecule produced from the union of an oxygen atom and its molecule.	....
15)	A bond that exists between water molecules.	....
16)	The product of dissolving nonmetallic oxides in water.	....
17)	Weak electrostatic attraction that arises between the molecules of the polar compounds.	....
18)	The measuring unit of the atomic size of an element.	....
19)	The number of protons inside the nucleus of the atom of an element.	....
20)	The halogen which exists in a solid state.	....
21)	The scientist who discovered that the atom contains positive protons in the nucleus.	....
22)	Elements which have properties of metals and nonmetals.	....
23)	Adding any substance to the water which changes its properties, affects the health and life of living organisms.	....
24)	The apparatus which is used for water electrolysis.	....

(2) Choose the right answer:

1.The properties of the element which has atomic number equals 17 are similar to the element which has atomic number equals ....

a. 7 b.9 c. 15 d. 20

2.................... is the lowest metallic element is group (1A).

a. Na b. Cs c. K d. Li

3.The oxide which dissolves in water and produces an acid is ....

a. MgO b. FeO c. CuO d . CO_2

4.The gas which is evolved on reacting alkali metals with water is ....

a. oxygen. b. nitrogen. c. hydrogen. d. helium.

5.The volume of hydrogen gas evolving from water electrolysis is .... the volume of oxygen gas .

a. equal to b. twice c. half d. four times

6.Elements of group (7 A) are known as ....

a. inert gases. b. alkali metals.

c. halogens. d. alkaline Earth metals.

7.Elements of the same period in the modern periodic table have the same ....

a. number of energy levels. b. atomic number.
c. number of electrons in the outermost energy level. d. valency.

8.Metal oxides are .... oxides.

a. acidic b. basic c. both of them d. no correct answer

9.There are .... bonds between water molecules.

a. ionic b. covalent c. hydrogen d. metallic

10.................... react very instantly with water and hydrogen gas evolves.

a. Kand Na b. Cu and Ag c. Zn and Fe d. Ca and Mg

11.................... is a polar compound.

a. Petrol b. Water c.Alcohol

12.The main energy levels discovered by Bohr in the atom are ....

a.7 b. 5 c. 3

13.The elements of group (7A) are known as ....

a. alkali metals. b. halogens. c. alkaline earth metals.

14.The scientist .... had discovered the main energy levels.

a. Moseley b. Bohr c. Hofmann d. Mendeleev

15.The atomic number of an element that exists in group (7 A) and period (2) is ....

a. 12 b. 7 c. 9 d. 17

16.Each period in the periodic table starts with a/an ....

a. metal. b. metalloid. c. nonmetal. d. inert gas.

17.................... is considered from halogens.

a. Sodium b. Chlorine c. Helium d. Calcium

18.The density of ice is .... the density of water.

a. less than b. more than c. equal to

19.All of the following metals react with water except ....

a. K b. Cu c. Na d. Mg

20.Eating fish, which contain high concentration of .... causes the death of brain cells.

a. mercury b. arsenic c. lead d. iron

21.Which of the following elements is located in the third period ? ....

a. $_{19}K$ b. $_{6}C$ c. $_{3}Li$ d. $_{15}P$

22.The atomic radius is measured in ....

a. nanometer. b. picometre. c. kilometer.

23.Ice crystals have .... shape.

a. tetragonal b. pentagonal c. hexagonal

24.The element, whose atomic number is (15) is similar in its chemical properties as the element whose atomic number is ....

a. 5 b. 7 c. 17 d. 19

25.The number of elements in the Earth's crust equals ....

a. 118 b. 92 c. 120

26.The transition elements start to appear from the beginning of the .... period.

a. second b. third c. fourth d. fifth

27.p-block contains .... groups.

a. 10 b. 2 c. 6 d. 8

28.The inert gas that has the same electronic structure as (Na^+) is ....

a. $_{10}Ne$ b. $_{2}He$ c. $_{18}Ar$ d. $_{17}Cl$

29.The modern periodic table contains .... elements.

a. 26 b. 92 c. 100 d. 118

30.Which of the following is an acidic oxide ? ....

a. CO_2 b . MgO c. Na_2O d . FeO

31.Which of the following is a radioactive element which is used in food preservation ?

a. Liquid sodium. b . Liquefied nitrogen.

c. Cobalt 60. d . Water.

32.Water has high boiling point due to the presence of .... bonds between its molecules.

a. hydrogen b . ionic c. covalent d . metallic

33.................... added group zero in his table for noble gases.

a. Mendeleev b. Moseley c. Rutherford d . Einstein

34.Which of the following is the halogen that exists in a solid state ? ....

a. Fluorine. b. Chlorine. c. Bromine. d. Iodine.

35.When putting a glass bottle completely filled with water in the freezer, it breaks because when water freezes its .... increases.

a. temperature b. density c. volume d. acidity

36.Which of the following elements don't react with water ? ....

a.Kand Na b. Ca and Mg c. Zn and Fe d. Cu and Ag

37.What is the volume of hydrogen gas evolved from electrolysis of acidified water if you know that the volume of oxygen gas evolved is 2 cm^3 ? ....

a. 1 cm^3. b. 2 cm^3. c . 4 cm^3. d. 6 cm^3

38.The transitional elements start to appear from period ....

a.2 b. 3 c. 4 d. 5

39.When sodium reacts with water .... gas evolves.

a . N_2 b. O_2 c . H_2

40.................... is considered from halogens.

a. Sodium b. Chlorine c . Helium

41.Sodium oxide from .... oxides.

a. amphoteric b. acidic c. basic

42.Each period in the modem periodic table starts with (a/an) .... element.

a. metallic b. inert c. nonmetallic

43.The elements of group (1A) are known as ....

a. alkali metals. b. halogens. c. alkaline Earth metals.

44.The largest atom of elements in size is .... atom.

a . cesium (Cs) b. fluorine (F) c. bromine (B)

✹(3) Complete the following :

1. Transition elements appear from period number ....in the modern periodic table.
2. .... is an example of polar compounds.
3. Increasing of mercury concentration in drinking water causes ....
4. Fluorine and chlorine exist in .... state.
5. Eating fish which contains high concentration of lead causes .... , but drinking water which contains high concentration of mercury leads to ....
6. Basic oxides are .... oxides and their solutions turn the litmus solution into ....
7. Alkali metals are good conductors of .... and ....
8. $CO_2 + H_2O \rightarrow$ ....
9. $Br_2 + 2KI \rightarrow$ .... + ...
10. Moseley arranged elements ascendingly according to ...., while Mendeleev arranged elements ascendingly according to ....The crystal of ice has .... shape.
11. The scientist .... discovered the main energy levels in the atom.
12. There are .... bonds between water molecules.
13. .... and ....are examples of polar compounds.
14. The valency of alkali metal elements is ....
15. Pure water boils at .... and freezes at ....
16. The strongest metallic element is found in group ....
17. Elements in group (1A) are called alkali metals as their elements react with .... forming ....solutions.
18. There are .... bonds between water molecules.
19. Elements that locate in the middle of the periodic table are called ....

20. Elements of group (1A) are called .... , but elements of group (7A) are called ....

21. The transition elements start to appear from the beginning of the .... period and symbolized by letter ....

22. The bond between hydrogen atom and oxygen atom in water molecule is .... bond, while bonds among water molecules are .... bonds.

23. Sodium is kept under the surface of . ... so , as not to react with ....

24. .... and .... are metals which don't react with water.

25. Elements of s-block are located on the .... side of the periodic table and they are arranged in .... groups.

26. .... is used in food preservation.

27. Moseley put .... and .... series below the periodic table.

28. "d" block elements are called the .... elements.

29. Cobalt 60 has the ability to kill ....

30. The strongest nonmetal lies in group ....

31. When the atomic number increases in the same period, the metallic property ....

32. $MgO + H_2O \rightarrow$...................

33. ....is from the examples of polar compounds because the difference in electronegativity between its elements is relatively ....

34. Mendeleev arranged the elements ascendingly according to .... ,while Moseley arranged them ascendingly according to ....

35. During the electrolysis of acidified water by Hofmann's voltammeter, the .... gas evolves at the anode, while the .... gas evolves at the cathode.

36. The number of groups in p-block is ....in modern periodic table.

37. Sodium reacts with water to produce ....gas.

38. Elements of group (1A) are called ....

39. Both sodium ($_{11}Na$) and potassium ($_{19}K$) are located in the same ....because they have the same number of ....

40. There are .... bonds between molecules of water

41. Number of elements in Mendeleev's periodic table ....

42. Number of elements in the modern periodic table ....

43. Maximum number of energy levels ....

44. The angle between water molecules ....

✹(4) Correct the underlined words:

1	Ice crystals have **round** shape	(……………………….)
2	Elements of **p-block** are organized in two groups.	(……………………….)
3	Sodium oxide is from **acidic** oxides.	(……………………….)
4	**Fluorine** is the only liquid halogen.	(……………………….)
5	**Sodium chloride** is from polar compounds	(……………………….)
6	**Chlorine** element has the smallest atomic size.	(……………………….)
7	**Rutherford** discovered the main energy levels.	(……………………….)
8	**Oil** is a covalent compound dissolves in water.	(……………………….)
9	Each period in the periodic table starts with **inert gas.**	(……………………….)
10	An element which is located in the 3rd period and group (2A) , its atomic number is **8**	(……………………….)
11	Mixing animals and human wastes with water causes **chemical** pollution.	(……………………….)
12	Eating food containing high percentage of lead causes **blindness**.	(……………………….)
13	The elements with the same physical and chemical properties have been put in **horizontal periods.**	(……………………….)
14	Transition elements start from the **second** period.	(……………………….)
15	**Inert gases** have the properties of metals and nonmetals.	(……………………….)
16	**Hydrogen** used in preserving eye cornea.	(……………………….)

17	Pure water has **acidic** effect on litmus paper.	(…………………………)
18	**Sodium** is used in making electronic slides.	(…………………………)
19	Cobalt 60 is used in preservation of **cornea of eye.**	(…………………………)
20	When the temperature of water decreases to less than **0°C**, its density decreases and, so it floats on water surface in the form of ice crystals.	(…………………………)
21	Mendeleev arranged the elements according to their **atomic number.**	(…………………………)
22	Alkali metals are **bad** conductors of heat and electricity.	(…………………………)
23	**Sodium** is considered as the most active metal in the periodic table.	(…………………………)
24	Elements of group 1A are known as **halogens**.	(…………………………)
25	**Covalent** bond is a weak electrostatic attraction force which arises among water molecules.	(…………………………)
26	If the metal lost one electron or more, it will become a **negative** ion.	(…………………………)

(5) Give reason for:

1. Water molecule is from polar compounds.

   ....

2. Dissolving of sugar in water although it is among covalent compounds.

   ....

3. Water has high boiling point.

   ....

4. Bromine cannot replace chlorine in sodium chloride.

   ....

5. The atomic size increases in the same group by increasing the atomic number.

   ....

6. Silicon slides are used in making electronics as computers .

   ....

7. Magnesium oxide is a basic oxide.

   ....

8. Cesium is the most active metal in group (1A).

   ....

9. Sugar dissolves in water.

   ....

10. Although sugar is a covalent compound, it dissolves in water.

    ....

11. Liquefied nitrogen is used in preservation of the eye cornea.

    ....

12. Cobalt 60 is used in food preservation.

    ....

13. Elements of the same group have similar properties.

    ....

14. Sodium is kept under the surface of kerosene.

    ....

15. Water density decreases on freezing.

    ....

16. Chlorine replaces bromine in potassium bromide solution.

....

17. Adding drops of dilute acid to water during its electrolysis.

....

18. Potassium reacts with water instantly and faster than sodium.

....

✸(6) What happen if:

1. Storing drinking water in plastic bottles.

   ....

2. Eating fish contains high concentration of lead.

   ....

3. Putting a magnesium strip in a test tube containing oxygen.

   ....

4. Dissolving magnesium oxide in water.

   ....

5. passage of electricity in Hofmann's voltammeter containing acidic water.

   ....

6. The pollution of water with animals and human wastes.

   ....

7. Decreasing water temperature to less than 4°C.

   ....

✸(7) Put (√) or (X) :

1. Nonmetal oxides dissolve in water forming acidic solutions. ( )
2. Silicon slides are good conductors of electricity. ( )
3. Alkali metals locate in group (2A) . ( )
4. Ice crystals have pentagonal shapes. ( )
5. In the period as the atomic number increases, the atomic size increases. ( )
6. Halogens are monovalent elements. ( )
7. The atomic size increases in the group by increasing the atomic number. ( )
8. Water and ammonia are non-polar compounds. ( )
9. Liquefied sodium is used in preservation of cornea of the eye. ( )
10. The atomic size decreases in periods as the atomic number increases. ( )
11. Halogens are from monovalent metals. ( )
12. Bohr had discovered the main energy levels. ( )
13. Each period starts with a weak metal. ( )
14. Water and ammonia are from polar compounds. ( )
15. Mendeleev arranged the elements ascendingly according to their atomic number. ( )
16. Water and ammonia are non-polar compounds. ( )
17. Liquefied sodium is used in the preservation of the eye cornea. ( )
18. Water molecules are linked together by ionic bond. ( )
19. Copper metal doesn't react with water. ( )
20. Hydrogen evolves at positive pole in Hofmann's voltameter. ( )
21. Density of ice is more than that of water. ( )
22. Ice crystals have pentagonal shapes . ( )

✸(9) Write the balanced chemical equations which express the following reactions :

1. Magnesium with dil. hydrochloric acid.

   ....

2. Bromine with potassium iodide.

   ....

3. Decomposition of acidified water by electricity into two elements hydrogen and oxygen.

   ....

4. Reaction of sodium with water.

   ....

5. Reaction of carbon dioxide gas with water.

   ....

6. Reaction of chlorine gas with potassium bromide solution.

   ....

7. Potassium iodide with bromine.

   ....

✹(10) Problems

1

Choose from column (B) what suits it in column (A) :

(A) Harms	(B) Pollutant
1. Death of brain cells. 2. Liver cancer. 3. Blindness.	a. lead. b. sodium. c. mercury. d. arsenic.

1- 2- 3-

2

From the following diagram which represents a part of the periodic table, answer the following questions :



[NB. The letters in the table don't represent the actual symbols of the elements]

1. Arrange the elements B, A, R, L descendingly according to the atomic size.
2. Complete the following :
   The shaded part represents .... elements.
3. Write the letter(s) of the element(s) which :
   (a) Belong(s) to d-block. (b) is/are from inert gases.
   (c) Belong(s) to alkali metals.

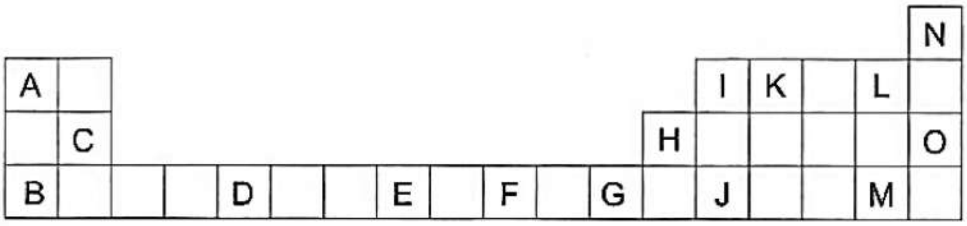
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....

....

3

Study the following figure which represents a section of the periodic table, then answer :



[NB. The letters in the table don't represent the actual symbols of the elements]

Write the symbol(s) which indicate(s) :

a. Halogens.

b. Inert gases.

c. The most active metal.

d. Transition elements.

4

Calculate the atomic number of :

1. Element (X) is located in the 3rd period and group (2A).

2. Element (Y) is located in the 1st period and group (1A).

....

....

....

5

Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Liquid sodium	a. is used in preservation of food.
2. Liquefied nitrogen	b. is used in manufacture of electronic devices.
3. Cobalt 60	c. is used in nuclear reactors.
4. Silicon slides	d. is used in preservation of cornea of the eye.

1- 2- 3- 4-

6

Study the opposite figures and answer the following questions :

1. Which figure represents a positive ion ?
2. Which figure represents a neutral atom ?
3. Determine the position of the atom in the periodic table.

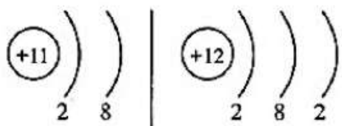


fig. (a) fig. (b)

....

....

....

Model Answer

(1) Write the scientific term:

1. Electronegativity
2. Bromine
3. Chemical activity series
4. Chemical activity series
5. Hofmann voltmeter
6. Hydrogen bond
7. Period
8. Hydrogen
9. Sodium
10. Single covalent bond
11. Cesium
12. Transition element
13. Nonmetals
14. Ozone
15. Hydrogen bond
16. Acidic oxide
17. Hydrogen bond
18. Picometer
19. Atomic number
20. Iodine
21. Rutherford
22. Metalloid
23. Water pollution
24. Hofmann voltmeter

(2) Choose the right answer:

1. B
2. D
3. D
4. C
5. B
6. C
7. A
8. B
9. C
10. A
11. B
12. A
13. B
14. B
15. C
16. A
17. B
18. A
19. B
20. C
21. D
22. B
23. C
24. B
25. B
26. C
27. C
28. A
29. D
30. A
31. C
32. A
33. B
34. D
35. C
36. D
37. C
38. C
39. C
40. B
41. C
42. A
43. A
44. A

(3) Complete the following :

1. Four
2. Water
3. Blindness
4. Gas
5. Death of brain cells – blindness
6. Base – blue
7. Heat – electricity
8. H_2CO_3
9. $KBr + I_2$
10. Atomic number – atomic weight
11. Bohr
12. Hydrogen
13. Water – ammonia
14. Monovalent
15. 100 – 0
16. 1A
17. Water - alkaline
18. Hydrogen
19. Transition element
20. Alkali metals – halogen
21. Four – d
22. Single covalent bond – hydrogen
23. Kerosene -Water
24. Ag – Cu
25. Left – two
26. Cobalt 60
27. Lanthanides – actinides
28. Transition
29. Microbes
30. 7A
31. Decrease
32. $Mg(OH)_2$
33. Water – high
34. Atomic weight – atomic number
35. Oxygen - Hydrogen
36. 6
37. Hydrogen
38. Alkali metals
39. Group – electrons in outermost energy level
40. Hydrogen
41. 67
42. 118
43. 7
44. 104.5

(4) Correct the underlined words:

1. Hexagonal
2. S-block
3. Basic
4. Bromine
5. Water
6. Fluorine
7. Bohr
8. Sugar
9. Metal
10. 12
11. Biological
12. Death of brain cell
13. Vertical group
14. Fourth
15. Metalloid
16. Liquefied nitrogen
17. Neutral
18. Silicon
19. Food
20. 4 degrees
21. Atomic weight
22. Good
23. Cesium
24. Alkali metals
25. Hydrogen
26. Positive

(5) Give reason for:

1- Because of the electronegativity difference between its elements is relatively high
2- Because sugar forms a hydrogen bond with water.
3- Due to the presence of hydrogen bonds between water molecules
4- Because bromine is less active than chlorine
5- Because the number of energy levels increases
6- Because it is semi-conductor
7- Because it dissolves in water forming alkalis which turn the color of litmus solution into blue
8- Because the metallic property increases in groups by increasing the atomic number
9- Because sugar forms a hydrogen bond with water
10- Because sugar forms a hydrogen bond with water
11- Due to the decrease of its boiling point.
12- Because it radiates (produces) gamma rays which prevent the reproduction of microbes
13- Because they have the same number of electrons in the outermost energy level.
14- Because they are metals which reacts strongly with water
$2Na + 2H_2O \rightarrow 2\ NaOH + H_2$
15- Because it's volume increase
16- Because it is more active than bromine
17- Because pure water is bad conductor of electricity
18- Because it is more active than sodium

(6) What happen if:

1. Plastic will react with chlorine gas leading to the increase in the infection rates by cancer
2. It causes the death of brain cells.
3. It burns with bright light and magnesium oxide is formed. $2Mg + O2 \xrightarrow{\Delta} 2MgO$
4. It forms alkalis which turn the color of litmus solution into blue. $MgO + H2O \rightarrow Mg(OH)2$
5. **1. Acidified water decomposes by electricity into:**
Oxygen gas evolves at the anode (because oxygen ions are negative)
Hydrogen gas evolves at the cathode (because hydrogen ions are positive)
2- The volume of hydrogen is twice the volume of oxygen.
Because water molecule H2O is composed of two hydrogen atoms and one oxygen atom
$$H2O \xrightarrow{\text{electrolysis}} O2 + H2$$
6. It causes many diseases such as: Bilharzia, typhoid and hepatitis.
7. Water molecules are collected and form crystal of hexagonal shape

(7) Put (√) or (X) :

1. (√)
2. (√)
3. (X)
4. (X)
5. (X)
6. (√)
7. (√)
8. (X)
9. (X)
10. (√)
11. (X)
12. (√)
13. (X)
14. (√)
15. (X)
16. (X)
17. (√)
18. (X)
19. (√)
20. (X)
21. (X)
22. (X)

(9) Write the balanced chemical equations which express the following reactions:

1- $Mg + 2HCl \rightarrow MgCl_2 + H_2 \uparrow$

2- $Br_2 + 2KI \rightarrow 2KBr + I_2$

3- $2H_2O \rightarrow 2H_2 + O_2$

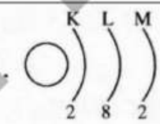
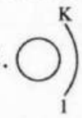
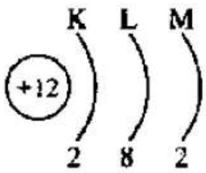
4- $2Na + 2H_2O \rightarrow 2NaOH + H_2$

5- $CO_2 + H_2O \rightarrow H_2CO_3$

6- $Cl_2 + 2KBr \rightarrow 2KCl + Br_2$

7- $Br_2 + 2KI \rightarrow 2KBr + I_2$

(10) Problems

1	1. a 2. d 3. c	4	1.  Atomic number of element (X) = 2 + 8 + 2 = 12 2.  Atomic number of element (Y) = 1
2	1. A > B > L > R 2. Metalloid 3. (a) N (b) H (c) E , A and C	5	1. c 2. d 3. a 4. b
3	a. L and M b. N and O c. B d. D , E , F and G	6	1. fig. (a). 2. fig. (b). 3.  period (3) group (2A)

Science prep.2 **November revision 2023-2024**

Q.1 :Write the scientific term

1. The most active metal. [ ]
2. A gas that is used in cornea preservation. [ ]
3. Non- metal elements are not exist in nature in elementary state .]
4. The element which has the largest atomic size. [ ]
5. Group of elements react with water forming alkaline solution [ ]
6. bond responsible for the abnormal property of water molecules .[ ]
7. A kind of water pollution results from discharging of factories residues [ ]
8. The angle between the two covalent bonds in water .[ ]
9. The bond which links the molecules of water . [ ]
10. Pollution causes rises in water temperature [ ]
11. An element used in liquid state inside nuclear reactor [ ]
12. An instrument used in water electrolysis [ ]
13. An element used in the preservation of cornea of eye [ ]
14. A positive pole in Hoffman voltameter [ ]
15. A kind of water pollution resulted from human activites [ ]
16. The addition of any substance to water that causes change in water properties and affect on living organisms health [ ]
17. An element used in food preservation [ ]
18. A water pollutants that causes death of brain cells [ ]
19. A gas which evolves at cathode during water electrolysis[ ]
20. A halogen in liquid state [ ]
21. A kind of ions which are formed by alkali metals during chemical reactions

[ ]

Q.2Complete the following

1. ……………. used to transfer the energy from inside the reactor to outside
2. The chemical activity of alkali metal ………….as the ....increases
3. ………….emits……rays which prevent the reproduction of microbial cells .
4. As the atomic number increases in group " 1 A" , the atomic size ....,
5. the metallic property ………….when the electro negativity ……………
6. Lithium element ……….in water as its density ....than that of water .
7. Alkaline metals react with water to produce ....gas .
8. Metal oxides are called …….while non – metals oxides are called………
9. is used in the manufacture of electronic slides ……………...
10. Valency of group 1A is ………………..while group 18 is ……………..
11. water molecules consist of ……………atoms and … …….atom
12. The density of water in …………state is lower than its density in ....state
13. The hydrogen bond is ………………than covalent bond
14. …………….is a good polar solvent.
15. the bond between hydrogen atom and oxygen atom in water is …………
16. Water has ....boiling point .
17. ……………..is the positive pole of Hoffman's voltmeter .
18. Water has ....effect on litmus solution .
19. Mixing of animals and human wastes with water leading to the infection by many diseases such as ………………………and ……………………
20. …………is a kind of water pollution results from mixing of humans and animals wastes with water .
21. ………….and..................................are from water pollutants .
22. water is considered as a good ....solvent .
23. In Hoffman voltameter oxygen gas evolved at …………………

Q.3 Give reason for :

1-the metals of group (1A) are called alkali metals.

…………………………………………………………………………………………

…………………………………………………………………………………………

2- Although Hydrogen gas exists in group (1A) it is a non-metal.

………………………………………………………………………………………...

3- Some of alkali metals are kept under kerosene or paraffin.

………………………………………………………………………………………..

4- Lithium is kept under Paraffin not kerosene.

………………………………………………………………………………………..

5- Alkali metals are monovalent elements.

………………………………………………………………………………………..

6- elements of group (17) are called Halogens.

………………………………………………………………………………………

………………………………………………………………………………………

7- Chlorine is used in the manufacture of correction substances.

………………………………………………………………………………………

8- elements of group (17) are monovalent elements.

…………………………………………………………………………………….

9- elements of group 17 don't exist individually.

……………………………………………………………………………………..

10- Sodium is used in its liquid state as it is a good conductor of heat.

………………………………………………………………………………………

11- Silicon slides are used in the manufactures of computers.

…………………………………………………………………………………….

12- Liquified Nitrogen is used in the preservation of cornea.

………………………………………………………………………………………

13- the radioactive cobalt is used in food preservation.

…………………………………………………………………………………

14- -A weak electrostatic attraction originated between water molecules which are called hydrogen bonds.

…………………………………………………………………………………..

15- the abnormality of water properties.

…………………………………………………………………………………

16- water is a unique substance.

…………………………………………………………………………………

17- Rising of the boiling point of water.

………………………………………………………………………………..

18- the density of water when it is in solid state is lower than when it is a liquid state.

…………………………………………………………………………………

…………………………………………………………………………………

………………………………………………………………………………..

19- Swimming in the sea is easier than swimming in the pole.

………………………………………………………………………………

20- Water is neutral liquid.

…………………………………………………………………………………

21-Mixing human and animal wastes of water cause many diseases.

………………………………………………………………………………..

22-water which used in the cooling of the nuclear reactors destroys the marine organisms found in it.

………………………………………………………………………………

………………………………………………………………………………

Q.4:What is the importance of? :

1. Silicon

   …………………………………………………………………………….

2. Sodium

   ……………………………………………………………………………

3. Liquefied Nitrogen

   ……………………………………………………………………………

4. Cobalt 60

   …………………………………………………………………………...

5. Hydrogen bonds in water.

   ……………………………………………………………………………..

6. Hoffman voltameter device

……..

Q.5:What happens by adding :

7. Chlorine to sodium bromide ……………………………………………

2. potassium to bromine ,…………………………………………………..

Q.6 :What's meant by :

1. Hydrogen bond :

………………………………………………………………………………………

2. Water pollution :

………………………………………………………………………………………

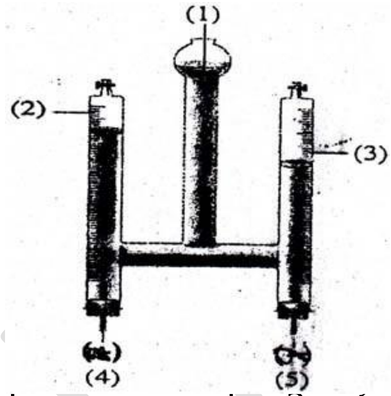
3.Halogens :

………………………………………………………………………………………

4. chemical pollution

………………………………………………………………………………………

Q.7From the opposite figure , answer the following questions :-



1. What is the name of this apparatus? …………………
2. Label the numbers (1) , (2) , (3) , (4) and (5) .
3. What happens if a glowing splint is put abovethe anode and the cathode ?

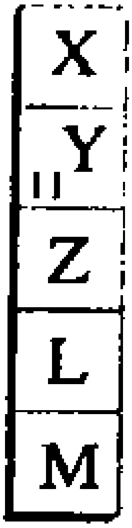
………………………………………………

…………………………………………….....

4. Calculate the volume of the gas that evolves at cathode if the gas at anode =2cm^3

………

Q.8:From the opposite fig. answer the following questions



1- what is the name of this group ?

……………………………………..

2- what is the valency of the elements of this group?

……………………………………………

3- what is the importance of element (Y)

……………………………………………

Q.9: Study the following elements then answer the following questions

$({}_{11}X), ({}_{17}Y), ({}_{14}Z).$

1- which element react strongly with water

……………………………………………………

2- Which element can replace iodine in potassium iodide solution

………………………………………………………

3- Enter in the manufacture of electronic slides

……………………………………………………..

4- Choose two elements when they react together, they form a salts

……………………………………………………………

Q.10 the opposite fig. represent Hoffman voltameter answer the following questions

1- Write the chemical equation that represent the reaction

……………………………………………………

2- What is the volume of gas which burn with a pop sound

If the volume of the other gas =10 cm^3 ?

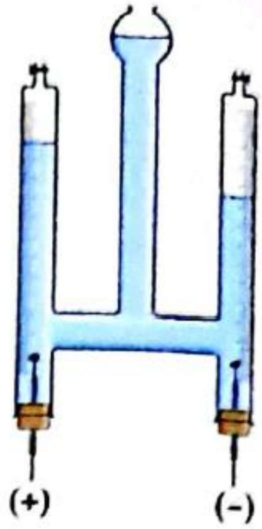
……………………………………………………

3- What is the name of the collected gas at anode and cathode?

……………………………………………………

4- What is the importance of this apparatus?

……………………………………………………



Q.11: Look at the following elements then answer the following questions

1- What is the type of this water pollution?

……………………………………………………

2- What happen if there is increasing in the ratio of :

A) arsenic element ……………………………….

B) Lead element ……………………………….



Q.12 :answer the following questions

1-arrange the following elements :

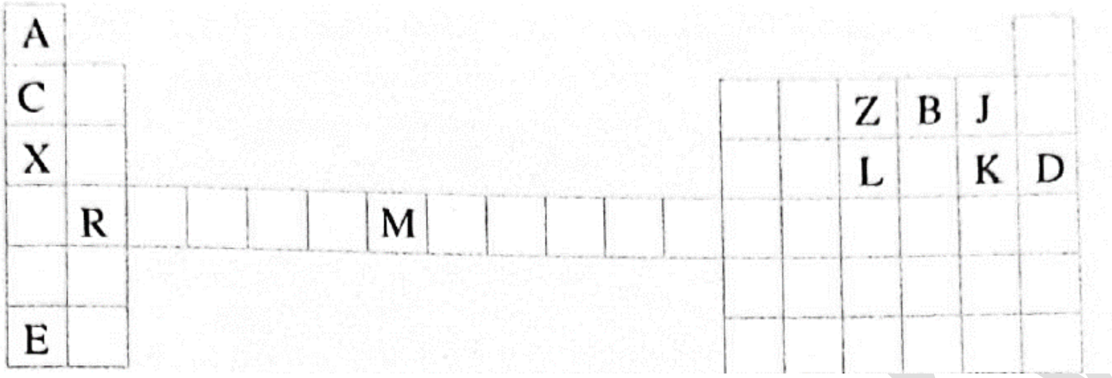
a) Ascendingly according to the degree of chemical activity

(Sodium – Rabidium – Lithium – Cesium)

b) Ascendingly according to the density :

(Na - K – Li – Rb – Cs)

Q.13: Study the following table then answer the following questions



1- What is the kinds of elements (X) - (M) – (D)

…………………………………………………………

2- Mention the element which represent :

a) The most active element in group 1A

…………………………………………

b) Halogen element

…………………………………………………………

c) Inert gas

………………………………………………………..

d) The element that has the largest atomic size

………………………………………………………..

Q.14 :Look at the following elements then answer the following questions



1- What is the type of this water pollution?

…………………………………………………………

2- What is the name of diseases that is caused by this type of water pollution?

………………………………………………..

3- Mention two methods of water protection

………………………………………………………………………………

Answers

Q.1 :Write the scientific term

1. Cesium
2. Liquefied nitrogen
3. Halogens
4. Cesium
5. Alkali metals
6. Hydrogen bond
7. Chemical pollution
8. 104.5
9. **Hydrogen bond** .
10. Thermal pollution
11. Sodium
12. Hoffman voltameter
13. Liquefied nitrogen
14. Anode
15. Artificial pollution
16. Water pollution
17. Cobalt 60
18. Chemical pollution
19. Hydrogen
20. Bromine 21- positive ion

Q.2

1. Liquefied sodium
2. Increase – atomic size
3. Cobalt 60 – gamma rays

4. increase
5. decrease – increase
6. floats - less than
7. Hydrogen
8. Basic - Acidic
9. Silicon
10. Mono valent – zero
11. Two hydrogen – one oxygen
12. Solid – liquid
13. weaker
14. water
15. single covalent
16. high .
17. anode .
18. neutral .
19. Bilhazia – typhoid
20. Biological
21. Chemical and thermal
22. Polar
23. Anode

Q.3 Give reason for :

1-Because they react with water forming alkali solutions.

$2Na + 2H_2O \; 2NaOH + H_2$

2- Because its atom is remarkably small and it is a gaseous element.

3-To prevent their reaction with moist air.

4- Because it floats on the surface of kerosene and it is immediately burns.

5- Because they contains one electron in the outer most energy level.

6- Because they react with metals forming salts.

2K + Br KBr

7- Because it is a very volatile liquid.

8- Because they gain one electron during the chemical reactions

9- Because they are chemically active.

10- Because it is used in the transferring heat from inside the nuclear reactor to outside.

11- Because they are semiconductors which their conductivity of electricity depends on the temperature.

12- Because it has a very low boiling point (-196° c).

13- Because it emits gamma rays which prevent the reproduction of microbial cells.

14- Due to the large electronegativity of oxygen compared with hydrogen.

15- Because of the presence of hydrogen bonds between its molecules.

16- Because its existence in the three states at the ordinary temperature.

17-Due to the presence of hydrogen bonds.

18-Because when it is in the temperature lower than 4 ° c, the water molecules are collected by hydrogen bonds forming hexagonal crystals with many spaces between them.

19- Because the density of salty water is higher than density of the fresh water.

20- Because when it is ionizes it gives equal numbers of positive hydrogen ions and negative hydroxide ions. (H+ = OH -).

21-Because it cause the biological pollution which makes (Bilharzia – typhoid – hepatitis)

22-because it rises the temperature of water

4- <u>What is the importances of :</u>

1. Used in the manufacture of electronic slides as computer and transistors
2. used to transfer heat energy from inside the reactor to outside
3. Used in preserving cornea of eye

4. Used in preserving food
5. bond responsible for the abnormal property of water molecules.
6. Used in water electrolysis

……………………………………………………………………………………………………..

5- What happens by adding :

1. Chlorine can replace bromine and sodium chloride is formed

$Cl + NaBr_2 \longrightarrow NaCl + Br_2$

2. potassium bromide salt is formed

$K + Br_2 \longrightarrow 2KBr$

6- What's meant by :

1. It is a type of electrostatic attraction that originates between the molecules of polar compounds
2. The addition of any substance to water that causes change in water properties and affect on living organisms health
3. Halogens they are non-metal elements located at the left side of periodic table before inert gases
4. A kind of water pollution resulted from discharging factories wastes and sewage in rivers ,seas and canals

Q.7:

1. Hoffman voltameter
2. (1) acidified water , (2) oxygen gas ,

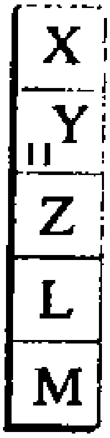
(3)hydrogen gas , (4) anode (5) cathode .

3- Above the anode its glowing will increase

Above the cathode it will burn with pop sound

4. $4cm^3$

Q.8:



1. Alkali metals
2. mono valent
3. used to transfer heat energy from inside the reactor to outside

……………………………………………………………………

Q.9:

$({}_{11}X), ({}_{17}Y), ({}_{14}Z).$

1- X

2- Y

3- Z

4- X and Y

……………………………………………………………………

Q.10

1. $2H_2O \xrightarrow[\text{Dil.}H_2SO_4]{\text{Electrolysis}} 2H_2 + O_2$

2 : 20 Cm^3

3- at anode oxygen - at cathode hydrogen ?

4-Analysis water into hydrogen and oxygen

……………………………………………………………

Q.11:

1- chemical water pollution

2- A) arsenic element causes liver cancer

B) Lead element damage of brain cells

Q.12 :

1-

a) Lithium – sodium – rubidium – cesium

b) Li - K - Na - Rb - Cs

Q.13:

1- X) : Alkalil metal - (M) : transition – (D: inert gas)

2- Mention the element which represent :

a) E

b) J -K

c) D

e) E

………………………………………………………..

Q.14 :

1- Biological water pollution

2-Bilharizia , typhoid and hepatitis

3- A) Prevention of getting rid of sewage and factories wastes in water

B) Disinfection of the dinking water tanks in a periodical manner

C) Don’t store tap water in empty plastic bottles

I - Lesson One :

1 – Elements have been arranged (organized) (classified) in order to............

a. ease (facilitate) their study
b. find the relation between elements and their properties
c. (a) and (b)
d. no correct answer

2 – The most important attempts of elements classification is (are)...................

a. Mendeleev's periodic table
b. Mosely's periodic table
c. the modern periodic table
d. all the previous answers

3 – The first real periodic table is...

a. Mendeleev's periodic table
b. Mosely's periodic table
c. the modern periodic table
d. all the previous answers

4 – The number of elements in Mendeleev's periodic table is.............elements

a. 92
b. 67
c. 76
d. 118

5 – Mendeleev organized the elements of similar physical and chemical properties in vertical columns known as............

a. periods
b. groups
c. tables
d. rows

6 – Mendeleev classified the elements of each group into..............sub-groups

a. 7
b. 2
c. 4
d. 3

7 – The scientific idea upon which the elements are classified in Mendeleev's periodic table is.........................

a. arranging elements in an ascending order according to atomic weights
b. arranging elements in an ascending order according to atomic numbers
c. arranging elements in a descending order according to atomic weights
d. arranging elements in a descending order according to atomic numbers

8 – Mendeleev discovered that the atomic weight of elements..........on moving from the left side to the right side through the period

a. increases b. decreases c. remains constant

9 – Mendeleev discovered that the properties of elements were repeated periodically by the beginning of each new................

a. group b. period c. cell

10 – The scientist who left vacancies in his table to be filled with suitable discovered elements in future is..........................

a. Mosely b. Rutherford c. Bohr d. Mendeleev

11 – One of the advantages of Mendeleev's table that is correcting the wrongly estimated ....of some elements

a. atomic numbers b. electron numbers c. atomic weights

12 – Mendeleev made a disturbance in the ascending order of the atomic weights of some elements to put them in.....................that suit their properties

a. periods b. groups c. tables d. places

13 – Mendeleev had to deal with the isotopes as......................elements

a. similar b. same c. different d. identical

14 – The nucleus of the atom contains..............

a. negative electrons b. negative protons c. positive protons

15 – The scientist who discovered that the nucleus of the atom contains positively charged protons is...............................

a. Bohr b. Mendeleev c. Rutherford d. Mosely

16 – The English scientist Mosely discovered after studying x-rays properties that the periodic properties of elements are related to their.....................

a. atomic numbers b. atomic weights c. mass numbers

17 - ....added zero group that includes inactive gases

a. Mendeleev b. Mosely c. Bohr d. Rutherford

18 – The scientist.......................had discovered the **main energy levels**

a. Mosely
b. Hofmann
c. Bohr
d. Mendeleev

19 – The number of energy levels in the heaviest known atom is............levels

a. 5 b. 7 c. 9 d. 11

20 – The scientific idea upon which the elements are categorized (arranged) in the modern periodic table is arranging of elements ....

a. according to their atomic numbers
b. according way of filling of energy sublevels with electrons
c. according to their atomic masses
d. (a) and (b) are correct answers

21 – The number of known elements in the modern periodic table till now is.......

a. 18 b. 26 c. 92 d. 118

22 – The number of elements which exist in nature is.............

a. 26 b. 95 c. 118 d. 92

23 – The number of elements which are prepared artificially is..........

a. 92 b. 26 c. 23 d. 1

24 – The modern periodic table consists of................horizontal periods

a. 18 b. 118 c. 7 d. 6

25 – The modern periodic table consists of................vertical groups

a. 18 b. 7 c. 118 d. 92

26 – The elements of s-block are located on the............side of the table

a. left b. right c. middle

27 – The elements of s-block are arranged in................groups

a. 5 b. 3 c. 7 d. 2

28 – The block that contains groups (1A) and (2A) is called..................block

a. s b. p c. d d. f

29 – The elements of p-block are located on the.............side of the table

a. left b. right c. middles

30 – Groups of p-block take the letter A except group.................

a. 1A b. 2A c. 8 d. zero

31 – The elements of p-block are arranged in................groups

a. 2 b. 7 c. 6 d. 5

32 – The block that contains groups (3A) and (7A) is called..................block

a. s b. p c. d d. f

33 – Nobel gases are located in group.............

a. 7A b. 8 c. 17 d. 18

34 – The new number of zero group is..............

a. Zero b. 17 c. 18 d. 16

35 – Noble (inert) gases are located in............block

a. s b. p c. d d. f

36 – Elements of d-block are located at the..........of the modern periodic table

a. middle
b. bottom
c. left
d. right

37 – Groups of d-block take the letter B except group.................

a. 1B
b. 2B
c. 8
d. Zero

38 – Elements of d-block are arranged in......................groups

a. 5
b. 10
c. 15
d. 7

39 – Elements of d-block are known as........................elements

a. lanthanides
b. actinides
c. transition

40– The transition elements **starts** to **appear** from the..........................period

a. 1st
b. 2nd
c. 3rd
d. 4th

41 – The **number** of **elements** in **period** (4) is...the **number** of **elements** in **period** (3)

a. more than
b. less than
c. equal to
d. double

42 – Elements of f-block are located at the.........of the modern periodic table

a. middle
b. bottom
c. left
d. right

43 – Lanthanides and actinides are located in the..........block

a. s
b. p
c. d
d. f

44 – The number of energy levels occupied by electrons in the atom of an element indicates its...............

a. atomic number
b. mass number
c. group number
d. period number

45 – The number of electrons in the outermost energy level of the atom of an element indicates its..................number

a. atomic
b. mass
c. group
d. period

46 – The element $_{12}\mathbf{X}$ lies in................in the modern periodic table

a. period (2) and group (2A)
b. period (2) and group (3A)
c. period (3) and group (2A)
d. period (3) and group (4A)

47 – **Helium** lies in group................

a. 1A
b. 2A
c. 15
d. 18 (zero)

48 – The element which its atomic number (2) is...........

a. transition element
b. an inert gas
c. metallic element
d. halogen element

49 – The element which its atomic number (18) is...........

a. transition element
b. an inert gas
c. metallic element
d. halogen element

50 – The **number** of **elements** in the **3rd period** of the **modern periodic table** is.........

a. 2
b. 8
c. 18
d. 32

51 – The number of electrons which saturate the first four energy levels can be obtained (calculated) from the relation...................

a. 2n
b. $2n^3$
c. $2n^2$

52 – The **atomic number** of elements equals..................

a. the sum of the numbers of neutrons inside the nucleus
b. the sum of the numbers of electrons rotating in its energy levels
c. the number of protons inside the nucleus
d. (b) and (c) are correct

53 – The number of negative electrons in the atom at its normal state equals......

a. number of protons
b. number of neutron
c. twice the number of protons
d. half the number of neutrons

54 – The number of protons and neutrons inside the nucleus of the atom of an element is known as...............

a. atomic number
b. mass number
c. period number
d. group number

55 – The atomic number of an element is an integer and it increases from the preceding element in the same period by..................electron (s)

a. 1
b. 2
c. 3
d. 4

56 – The **atomic number** of an element which lies in **period 4** and **group 2A** is.....

a. 4 b. 18 c. 12 d. 20

57 – The element which locates in **period (3)** and **group (3A)** is............

a. $_{13}Al$ b. $_{5}B$ c. $_{11}Na$ d. $_{15}P$

58 – The **atomic number** of an element exists in **group (7A)** and **period (2)** is.....

a. 12 b. 7 c. 9 d. 17

59 – An element in the **third** period and group number **13**, the number of neutrons in its nucleus equals 14, so its mass number equals..........

a. 27 b. 9 c. 15 d. 20

60 – Elements of **group (6A)** in the periodic table have the same...........

a. number of protons
b. number of energy levels occupied by electrons
c. number of neutrons
d. number of electrons in the outer levels

61 – In the periodic table, elements which are **identical** in **properties** lie in the same...

a. period b. group c. nucleus d. row

62 – The chemical **properties** of **calcium** (**$_{20}Ca$**) are **similar to** those of..........

a. $_{19}K$ b. $_{12}Mg$ c. $_{25}Mn$ d. $_{3}Li$

63 – The element whose **atomic number** is (17) is **similar** in its **chemical construction** to the element which its **atomic number** is..........

a. 2 b. 7 c. 9 d. 19

64 – Which of the following belongs to the **same group** in the periodic table?..........

a. $_{11}Na$, $_{6}C$ b. $_{11}Na$, $_{3}Li$ c. $_{11}Na$, $_{29}Cu$ d. $_{11}Na$, $_{10}Ne$

65 – All the following elements are located in group (2A) ***except***..............

a. $_{4}Be$ b. $_{20}Ca$ c. $_{11}Na$ d. $_{12}Mg$

66 – Elements of the **same period** in the modern periodic table have the same...

a. number of protons
b. number of energy levels occupied by electrons
c. number of neutron
d. number of electrons in the outer levels

67 – In the periodic table, elements which are **different** in **properties** lie in the same...

a. period
b. group
c. nucleus
d. column

68 – Which of the following elements in the **same period** with $_{12}$**Mg**?.............

a. $_{7}N$ b. $_{15}P$ c. $_{3}Li$ d. $_{20}Ca$

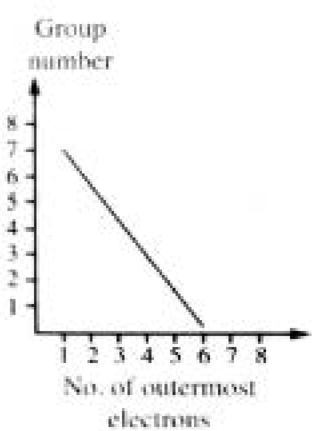
69 – Which of the following elements locates in the **third period**?.....................

a. $_{7}N$ b. $_{15}P$ c. $_{3}Li$ d. $_{19}K$

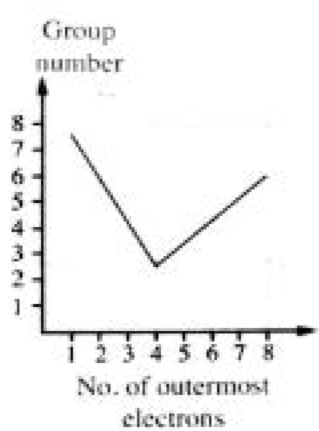
~~70~~ – Two elements $_{15}^{31}$**P** and $_{16}^{32}$**S** are similar in..............

a. number of group and protons
b. number of period and neutrons
c. number of group and neutrons
d. number of period and protons

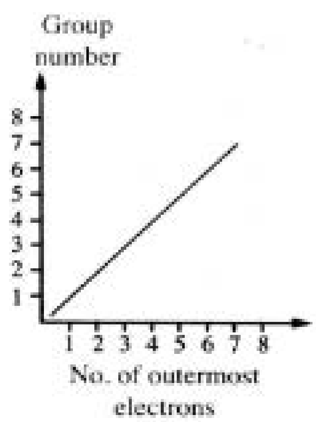
71 – Which of the following graphs represents the **relation** between the **number of electrons in the outermost energy level** and the **group number**, through the 3rd period in the modern periodic table? Why?



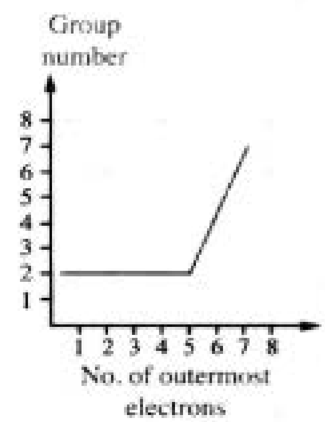
(A)



(B)



(C)



(D)

2 - Lesson Two :

1 – The atomic radius is used as a measurement of the atomic size of the atom and its measuring unit is......................

a. metre
b. millimeter
c. nanometre
d. picometre

2 – In groups, by increasing the atomic number............................

a. atomic size decreases
b. atomic size increases
c. atomic radius increases
d. no correct answer

3 – In periods, by increasing the atomic number................................

a. atomic size decreases
b. atomic size increases
c. atomic radius increases
d. no correct answer

4 – ....is the element that has the smallest atomic size in the periodic table

a. F
b. O
c. Cs
d. Na

5 - ....is the element that has the largest atomic size the periodic table

a. F
b. O
c. Cs
d. Na

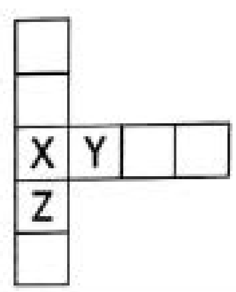
– In group (1A), the atomic size of rubidium ($_{37}Rb$) is greater than that of..........

a. $_{3}Li$
b. $_{11}Na$
c. $_{19}K$
d. (a), (b) and (c)

– In period (2), the atomic size of oxygen ($_{8}O$) is greater than that of............

a. $_{6}C$
b. $_{9}F$
c. $_{3}Li$
d. $_{5}B$

– In the opposite figure,..............................represents the ascending arrangement for the element (X, Y and Z) according to the atomic size



a. $Z > Y > X$
b. $Y < X < Z$
c. $Y > Z > X$
d. $X < Y < Z$

6 – From the polar compounds is (are)...

a. ammonia molecule
b. water molecule
c. methane molecule
d. (a) and (b)

7 – Which of the following is a metallic element?...............

a. $_{12}Mg$
b. $_{17}Cl$
c. $_{8}O$
d. $_{10}Ne$

8 – During the chemical reactions, metal atoms tend to..................

a. lose electrons and change into negative ions
b. gain electrons and change into negative ions
c. lose electrons and change into positive ions
d. gain electrons and change into positive ions

9 – The electronic structure of the positive ions is similar to that of the nearest.............

a. preceding inert gas
b. following inert gas
c. next inert gas
d. similar inert gas

10 – Positive ion carries a number of positive charges equal to the number of.............

a. gained electrons
b. lost electrons
c. shared electrons
d. lost protons

11 – All the followings have the same electronic configuration of neon ($_{10}Ne$) atom except.

a. Al^{+3}
b. Na^{+}
c. Li^{+}
d. Mg^{+2}

12 – The electronic structure of sodium ion (Na^{+}) is similar to that of............

a. $_{7}N$
b. $_{18}Ar$
c. $_{10}Ne$
d. $_{8}O$

13 – The electronic structure of magnesium ion (Mg^{+2}) is similar to all of the following except.........

a. Na^{+}
b. $_{10}Ne$
c. Al^{+3}
d. $_{18}Ar$

14 – An element (Y), its atomic number is 13, so the electronic configuration of its ion is...

a. 2.,8,3
b. 2,8
c. 2,8,8
d. 2,8,8,3

15 – An element (X), its atomic number is 12, so the number of electrons in its ion equals.

a. 10 b. 15 c. 17 d. 18

16 – The difference between sodium atom ($_{11}Na$) and sodium ion (Na^+) is the number of...

a. protons
b. electrons
c. energy levels
d. (b) and (c)

17 – The number of electrons located in the ***ion*** of trivalent metallic element whose electrons are arranged in three energy levels is..................................

a. 3 b. 8 c. 10 d. 13

....
....
....

18 – Which of the following is a nonmetallic element?..................

a. $_{11}Na$ b. $_{12}Mg$ c. $_{13}Al$ d. $_{17}Cl$

19 – During the chemical reactions, nonmetal atoms tend to................

b. lose electrons and change into negative ions
c. gain electrons and change into negative ions
d. lose electrons and change into positive ions
e. gain electrons and change into positive ions

20 – The electronic structure of the negative ions is similar to that of the nearest.........

a. preceding inert gas
b. following inert gas
c. previous inert gas
d. similar inert gas

21 – Negative ion carries a number of negative charges equal to the number of.............

a. gained electrons
b. lost electrons
c. shared electrons
d. lost protons

22 – All the followings have the same electronic configuration of neon ($_{18}Ar$) atom except

a. P^{-3} b. S^{-2} c. Cl^- d. Na^+

23 – The electronic structure of sulphur ion (S^{-2}) is similar to that of............

a. $_7N$ b. $_{18}Ar$ c. $_{10}Ne$ d. $_8O$

24 – The electronic structure of phosphorus ion (P^{-3}) is similar to all of the following except.............

a. $_{18}Ar$ b. Cl^- c. P^{-3} d. Na^+

25 – An element (Y), its atomic number is 17, so the electronic configuration of its ion is...

a. 2,8,7 b. 2,8,8 c. 2,8,8,7 d. 2,8,1

26 – An element (X), its atomic number is 15, so the number of electrons in its ion equals

a. 10 b. 17 c. 18 d. 20

27 – The difference between chlorine atom ($_{17}Cl$) and chloride ion (Cl^-) is the number of..

a. electrons
b. protons
c. energy levels
d. (a) and (c)

28 – The nucleus of X^{-2} ion is surrounded by 18 electrons revolve around it and the mass number of this ion equals 32, so the number of electrons in the X atom is............and the number of its neutrons is................

a. 16, 23 b. 18, 23 c. 18, 21 d. 16, 16

....

....

....

29 – All the following from the semi-metals (metalloids) except.........

a. tellurium b. silicon c. boron d. bromine

30 – Each period in the periodic table starts with...............

a. metal b. nonmetal c. metalloid d. inert gas

31 – Each period in the periodic table ends with...............

a. metal b. nonmetal c. metalloid d. inert gas

32 – By increasing the atomic number within the period, the....................

a. atomic size decreases
b. metallic property decreases
c. nonmetallic property increases
d. all the previous answers

33 – By increasing the atomic number within group (1A), the.........................

a. atomic size decreases
b. nonmetallic property increases
c. metallic property increases
d. all the previous answers

34 – The strongest metallic elements lies in group.............................

a. 1A
b. 7A
a. 2A
b. zero

35 – The most metallic element in group (1A) is......................

a. Na
b. Cs
c. K
d. Li

36 – The least metallic element in group (1A) is....................

a. Na
b. K
c. Cs
d. Li

37 – By increasing the atomic number within group (7A), the................

a. atomic size decreases
b. metallic property increases
c. nonmetallic property decreases
d. all the previous answers

38 – Which of the following metals react with dilute hydrochloric acid?...........

a. C
b. Cu
c. S
d. Zn

39 – All the following elements **don't** react with dilute HCl acid **except**..........

a. Cu
b. Zn
c. Mg
d. (b) and (c)

40 – When magnesium reacts with dilute hydrochloric acid, this produces........

a. magnesium oxide and hydrogen gas evolves
b. magnesium chloride and oxygen gas evolves
c. magnesium chloride and hydrogen gas evolves
d. no correct answer

41 – Metal oxides (as sodium oxide) are…………oxides

a. acidic
b. basic
c. amphoteric
d. neutral

42 – Magnesium reacts with oxygen giving…………….

a. $Mg(OH)_2$
b. MgO
c. $MgCl_2$
d. $MgSO_4$

43 – Magnesium oxide dissolves in water giving……………..

a. $Mg(OH)_2$
b. MgO
c. $MgCl_2$
d. $MgSO_4$

44 – Magnesium hydroxide turns the colour of litmus solution into………………

a. red
b. blue
c. orange
d. violet

45 – All the following are related to MgO except…………….

a. it is a basic oxide
b. it is a metal oxide
c. its solution turns litmus into red
d. its solution turns litmus into blue

46 – Sodium oxide (Na_2O) and calcium oxide (CaO) are from……………oxides

a. amphoteric
b. acidic
c. nonmetallic
d. basic

47 – When sodium or potassium reacts with water,…………….gas evolves

a. N_2
b. O_2
c. H_2
d. CO_2

48 - …………………react very slowly with cold water

a. Ca – Mg
b. K – Na
c. Zn – Fe
d. Cu - Ag

49 - ……………………react with hot water vapour at high temperatures

a. Ca – Mg
b. K – Na
c. Zn – Fe
d. Cu - Ag

50 – All the following metals react with water except………………..

a. K
b. Mg
c. Fe
d. Ag

51 – Nonmetal oxides (as carbon dioxide) are............oxides

a. acidic
b. basic
c. amphoteric
d. no correct answer

52 – Carbon reacts with oxygen giving.................

a. CO
b. CO_3
c. CO_2
d. Na_2O

53 – Carbon dioxide dissolves in water giving.................

a. H_2CO_3
b. HCO_2
c. H_3CO_2
d. H_2CO

54 – Carbonic acid turns the colour of litmus solution into...............

a. red
b. blue
c. orange
d. violet

55 – All the following are related to CO_2 except................

a. it is an acidic oxide
b. it is a nonmetal oxide
c. its solution turns litmus into red
d. its solution turns litmus into blue

56 – Sulphur oxide is from................................oxides

a. acidic
b. basic
c. amphoteric
d. neutral

57 – Which of the following is a basic oxide........................

a. CO_2
b. $Mg(OH)_2$
c. Na_2O
d. (b) and (C)

58 – Which of the following is an acidic oxide......................

a. CO_2
b. SO_3
c. Na_2O
d. (a) and (b)

59 – The oxide which dissolves in water and produces an alkali is................

a. CO_2
b. MgO
c. CaO
d. (b) and (C)

60 – The oxide which dissolves in water and produces an acid is...................

a. CO_2
b. $Mg(OH)_2$
c. Na_2O
d. (b) and (C)

61 – Al_2O_3 is known as..........................oxide

a. acidic
b. basic
c. amphoteric
d. neutral

62 – The 3rd period starts with elements their oxides as the following......................

a. acidic, amphoteric then basic
b. acidic, basic then amphoteric
c. basic, acidic then amphoteric
d. basic, amphoteric then acidic

2nd Preparatory – First Term - Lesson 1 – Part 1 (…. / 20)

1 - Write the scientific term for each of the following :

1. They are **indicated** by the **letters** s,p,d,f (……………..)
2. **Ascending** order of the **elements** according to their **atomic weights** (……………..)
3. The **rays** that **Moseley** used in his studies (……………..)
4. The horizontal rows in Mendeleev's periodic table (……………..)
5. The **book** in which Mendeleev had explained his periodic table (……………..)

2 - Complete the following statements :

1. **Moseley** added…………….**group** which includes…………..**gases**
2. **Mendeleev** left……………….in his table **predicting** the **discovery** of…………….
3. The **two scientists**………..and………..made **modifications** on **Mendeleev's** table
4. **Mendeleev** had to put more than one element in one single cells as…….,……and….

3 - Give reason for each of the following :

1. Scientists thought about classifying elements according to their properties?………… ………

4 – To who these achievements are attributed ?

1. Discovered that the nucleus of the atom contains protons (…………….)
2. Specified a place below the table for lanthanides and actinides (…………….)
3. Discovered the main energy levels (…………….)
4. Corrected (accurate) the atomic weights of some elements (…………….)

5 – Choose the odd symbol out, then write the scientific term :

1. K – F – L – O (……………..)

   The scientific term :……………………………………………………………………

2. s – b – d – f (……………..)

   The scientific term :……………………………………………………………………

6 – Choose the correct answer :

1. The **number** of **energy levels** in the **heaviest** known **atom** is............**levels**
   a. 5 b. 7 c. 9 d. 11

2. **Mendeleev** had to **deal** with the **isotopes** as......................**elements**
   a. similar c. different
   b. same d. identical

3. **Mendeleev** made **a disturbance** in the **ascending order** of the **atomic weights** of some elements to **put** them in.....................that **suit** their **properties**
   a. periods c. tables
   b. groups d. places

7 – Study the opposite figure, then answer the question :

Does the opposite table is **a part** of **Mendeleev periodic table** or **Moseley's periodic table**? (**Mention** the **reason**)

Li 7	Be 9.4	B 11	C 12	N 14	O 16	F 19
Na 23	Mg 24	Al 27.4	Si 28	P 31	S 32	Cl 35.5

....
....
....

THANK YOU

2nd Preparatory – First Term - Lesson 1 – Part 2 (…. / 20)

1 - Write the scientific term for each of the following :

1. **Elements** of "f" block that are located below the table (………………)
2. **Elements** of "d" block in the modern periodic table (………………)
3. **Elements** of group zero in the modern periodic table (………………)

2 - Complete the following statements :

1. **Elements** of **groups**………are located on the **left** and **right** sides of the table, while **elements** of **groups**……………are located in the **middle** of the table
2. The **modern periodic table** consists of………**horizontal periods**
3. The number of elements which are found in the **Earth's crust** is…………, while the rest of elements are **prepared**………………………
4. The **number** of **elements** in the 3rd **period** of the **modern periodic table** is………
5. **Groups** of **p-block take** the **letter**……….,**except** group……..that contain………….
6. **Groups** of **d-block take** the **letter**……….,**except** group……..that contain………….

3 - Give reason for each of the following :

1. The modern periodic table consists of 7 horizontal periods?……………………………………
   ……………………………………………………………………………………………………

4 - Put (√) or (x) then correct the false statement :

1. The number of known elements in the modern periodic table is 181 (………..)
2. The transitional elements groups are symbolized by (d) (………..)
3. The traditional number of group 5 is 5B (………..)

5 – Complete the following table :

P.O.C	s-block elements	p-block elements	d-block elements
Location	…………………………	…………………………	…………………………
No. of groups	…………………………	…………………………	…………………………

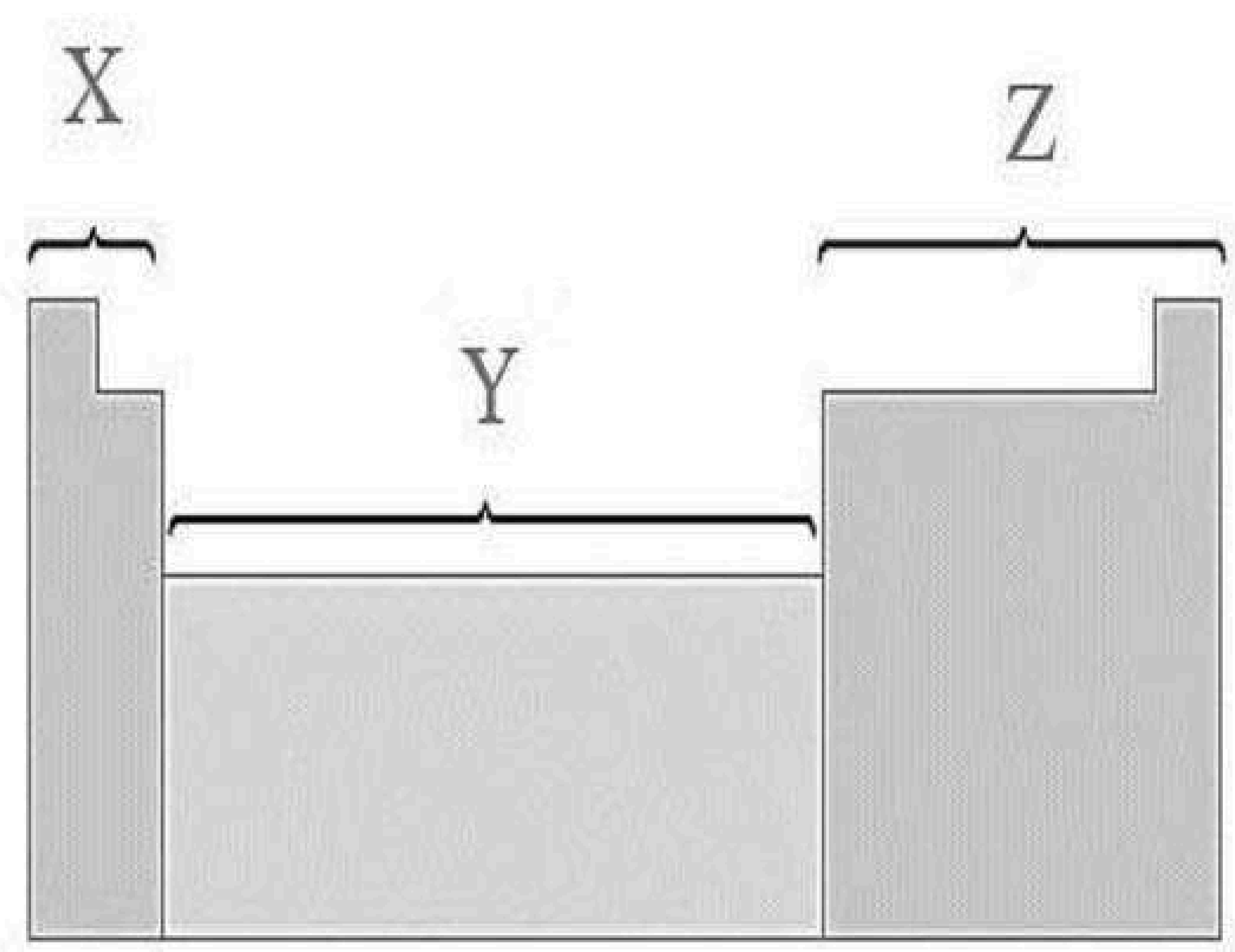
6 – Choose the correct answer :

1. **Noble (inert)** gases are located in............block
   a. s
   b. p
   c. d
   d. f
2. **Elements** of **d-block** are known as.......................**elements**
   a. lanthanides
   b. actinides
   c. Alkali metals
   d. transition
3. The **transition** elements **start** to **appear** from the.........................**period**
   a. 1st
   b. 2nd
   c. 3rd
   d. 4th
4. The **number** of **elements** in **period** (4)is... **number** of **elements** in **period** (3)
   a. more than
   b. less than
   c. equal to
   d. double

7 – Study the opposite figure, then answer :

From the opposite figure :

1. What are the **names** of the blocks **X**, **Y** and **Z**?
   ....
   ....
2. What is **number** of **groups** in each **block**?.....
   ....
3. What is the **new (modern) number** of **7A** and **zero** groups?...
   ....



THANK YOU

2nd Preparatory – First Term - Lesson 1 – Part 3 (…. / 20)

1 - Write the scientific term for each of the following :

1. It **indicates** the **number** of **energy levels** occupied by **electrons** (……………..)
2. The **number** of **electrons** rotating around the nucleus of the atom (……………..)

2 - Complete the following statements :

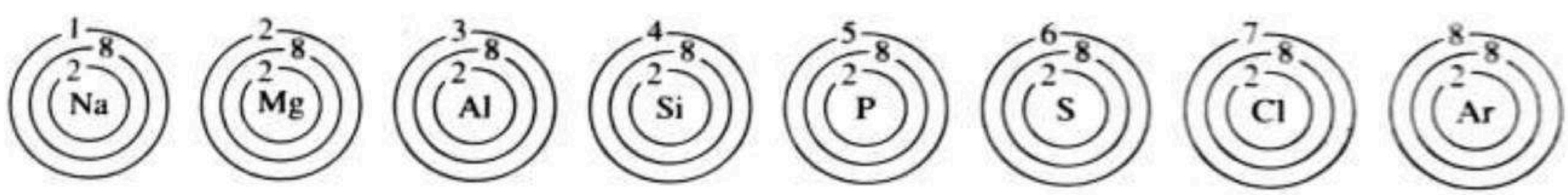
1. **An element** $_{13}X$ **lies** in **period**……….and **group**…………in the modern parodic table
2. **An element** whose 2nd **energy level** contains one **electron**, so it **lies** in the………. **period** and **group**………….in the modern periodic table
3. The **elements** ($_{3}X$), ($_{11}Y$) and ($_{19}Z$) are **similar in** the……………………number, while the **elements** ($_{3}X$), ($_{4}W$) and ($_{5}D$) are **similar** in the………………number
4. **An element** exists in the 3rd **period** and **group** (2A), so its **atomic number** is……..
5. **An inert gas** lies in the 2nd period, so its **atomic number** is……….

3 - Give reason for each of the following :

1. Helium ($_{2}He$) is located in group zero, but it doesn't locate in group (2A)?…………… ……………………………………………………………………………………………………
2. Scientists can't discover a new element between sulphur ($_{16}S$) and chlorine ($_{17}Cl$)?… ……………………………………………………………………………………………………

4 – Study the opposite figure, then answer :

From the following figure :



1. What is the **number** of this **period**? **Give reason**
2. **Does** the **period** contain an element from **d-block**? **Give reason**
3. From the period, **Determine** :
   a. **Elements** of s-**block**
   b. **Elements** of p-**bloc**

……………………………………………………………………………………………………

5 – Answer the following questions :

1. You have 3 **elements**, X, Y and Z of **atomic numbers** 12, 13. 14 **respectively**. **Answer** the following questions :
   a. **Explain** their **electronic distribution**
   b. **Determine** their **positions** in the **modern periodic table**.
   c. **In which block** does each of them lie (exist)?
   d. The element **Y** lies at.............the modern periodic table (choose)
      1. right side of
      2. left side of
      3. below

....
....
....
....

2. **A trivalent nonmetallic** element lies in 3rd **period** in the periodic table, its **nucleus** contains 15 **neutrons** .**Calculate** its **atomic** number, **mass** number and its **block** name

....
....
....
....

6 – Choose the correct answer :

1. The **element** which its **atomic number** (2) is...........
   a. transition element
   b. an inert gas
   c. metallic element
   d. halogen element
2. The **element** which its **atomic number** (18) is...........
   a. transition element
   b. an inert gas
   c. metallic element
   d. halogen element

THANK YOU

2nd Preparatory – First Term - Lesson 1 – Part 4 (.... / 20)

1 – Compare between the following items :

1. The **group** and the **period**

P.O.C	The group	The period
Number of energy levels	....	....
Number of electrons in the outermost energy level	....	....
Chemical properties	....	....

2 - Complete the following statements :

1. The **element** which has the **atomic number** (3) has......................**properties** to the **element** which has the **atomic number** (12) as they **locate** in **different**.................
2. **X** and **Y** are **two adjacent** elements located in **one period**, if the atomic number of Y is 15, so the **atomic number** of (X) **may be**......................or........................
3. **A** and **B** are **two successive** elements in **one group**, if the atomic number of A = 3, so the **atomic number** of (B) **may be**..................or.........................

3 - Give reason for each of the following :

1. Elements of the same group have similar properties?..
....

4 – Choose the odd symbol out, then write the scientific term :

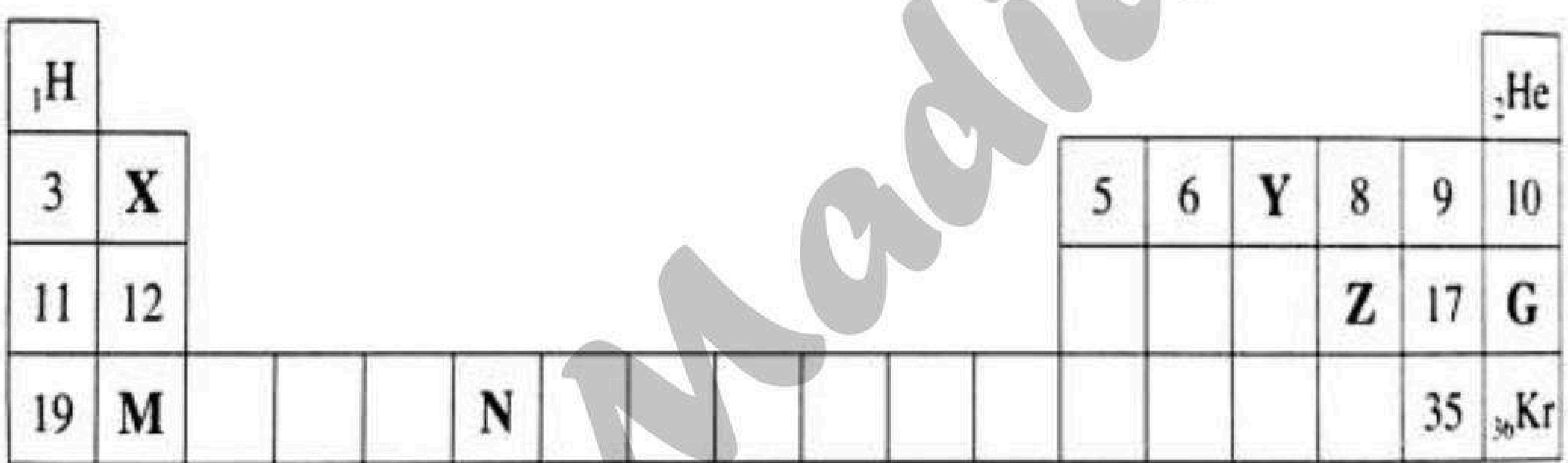
1. $_{2}He$ – $_{10}Ne$ – $_{18}Ar$ – $_{12}Mg$ (..................)
The scientific term :..
2. $_{3}Li$ – $_{6}C$ – $_{4}Be$ – $_{13}Al$ (..................)
The scientific term :..

5 – Choose the correct answer :

1. The **element** whose **atomic number** is (17) is **similar** in its **chemical properties (construction)** to the **element** which its **atomic number** is...........
   a. 2 b. 7 c. 9
2. Which of the following elements in the **same period** with $_{12}$**Mg**?.............
   a. $_{7}N$ b. $_{15}P$ c. $_{20}Ca$
3. Two elements $_{15}^{31}\mathbf{P}$ and $_{16}^{32}\mathbf{S}$ are similar in...............
   a. number of group and protons
   b. number of period and neutrons
   c. number of group and neutrons
   d. number of period and protons

6 – Study the following figure, then answer the questions :

Using the following diagram of the periodic table, **answer** the following questions :



1. Write the letter(s) of the element(s) which :
   a. among transition elements (.........................)
   b. in period (3) and group (6A) (.........................)
   c. among nobel gases (.........................)
2. Choose :
   a. The **letter** (M) represents..............**element**
      a. 12Mg b. $_{16}S$ c. $_{20}Ca$ d. $_{18}Ar$
   b. The **element** (N) lies in...................**block**
      a. s b. p c. d d. f
3. What is the **atomic number** of the elements **N** and **Z**?

....

THANK YOU

2nd Preparatory – First Term - Lesson 2 – Part 1 (…. / 15)

1 - Write the definition of each of the following :

1. Picometre (Pm) :……………………………………………………………………………………………
   ………

2 - Write the scientific term for each of the following :

1. The **smallest** atomic size element in the periodic table (……………..)
2. The **largest** atomic size element in the periodic table (……………..)

3 - Complete the following statements :

1. ……….is used as a measure for atomic size of an atom and its measuring unit is………
2. In **periods,** the **atomic size** is……………………proportional to the **atomic number**
3. Elements of **group**……………have the **largest** atomic sizes in the modern periodic table, while elements of **group**…………….have the **smallest** atomic sizes
4. The **atomic size** of **lithium** ($_3Li$) **atom** is…………than that of **nitrogen** ($_7N$) **atom** and…………….than that of **sodium** ($_{11}Na$) **atom**

4 - Give reason for each of the following :

1. In groups, by increasing the atomic number, the atomic size increases?……………….
   ………
2. In periods, by increasing the atomic number, the atomic size decreases?……………….
   ………

5 - Put (√) or (x) then correct the false statement :

1. In **groups**, the atomic size increases as we go from top to bottom (…………)
2. The atomic size of ($_{11}Na$) atom is more than that of ($_{19}K$) (…………)
3. In **periods**, the atomic size increases as we go from left to right (…………)
4. The **element** ($_8X$) has smaller **atomic size** than **element** ($_6Y$) (…………)

6 – Choose the correct answer :

1. In **group** (1A), the **atomic size** of r**ubidium** (**$_{37}Rb$**) is **greater than** that of..........
   a. $_{3}Li$
   b. $_{11}Na$
   c. $_{19}K$
   d. (a), (b) and (c)

2. In **period** (2), the **atomic size** of **oxygen** (**$_{8}O$**) is **greater than** that of.............
   a. $_{6}C$
   b. $_{9}F$
   c. $_{3}Li$
   d. $_{5}B$

THANK YOU

2nd Preparatory – First Term - Lesson 2 – Part 2 (.... / 10)

1 - Write the definition of each of the following :

1. Electronegativity :...
   ....

2 - Write the scientific term for each of the following :

1. **A kind** of **elements** that **doesn't have** electronegativity (.................)

3 - Complete the following statements :

1. ....and.....................are **examples** of **polar compounds**
2. In **water molecule**,...................atom **attracts** the **electrons** of the bond **more than** ....atom as it has higher...................

4 - Give reason for each of the following :

1. Ammonia molecule (NH_3) is from the polar covalent compounds?...........................
   ....
2. Water is more polar than ammonia?...
   ....

5 – What happens when :

1. The electronegativity difference between the hydrogen atom and oxygen atom in water molecule is vanished?...

6 - Put (√) or (x) then correct the false statement :

1. The covalent bond becomes a polar bond when the difference in electronegativity between the bonded atoms = zero (............)
2. Methane is from polar compounds (............)
3. The bond between atoms in water molecule is a covalent bond (............)

THANK YOU

2nd Preparatory – First Term - Lesson 2 – Part 3 (…. / 20)

1 - Write the definition of each of the following :

1. Metalloids (semi-metals) :…………………………………………………………………………………
……

2 - Write the scientific term for each of the following :

1. An atom **lost** or **gained** one electron or more during chemical reactions (…………..)
2. The **inert gas** which has the same electronic structure of (P^{-3}) (…………..)

3 - Complete the following statements :

1. The **last level** of **metallic** elements contains………than **four electrons**, while that of **nonmetallic elements** contain…………….than **four electrons**
2. During the chemical reaction, **magnesium** (**$_{12}$Mg**) atom loses……………electrons and changes into a…………..ion, which carries…………positive charges
3. **A negative ion** carries a number of……..charges equals number of the……electrons
4. **Silicon** (**$_{14}$S**) is a……………..element which has the properties of………and………..

4 - Give reason for each of the following :

1. **Sodium** ($_{11}$Na) atom tends to form **a positive ion**,?…………………………………………
……

5 – What happens when :

1. A metallic atom **loses** one electron or more during the chemical reaction?…………..
……
2. A nonmetallic atom **gains** one electron or more during the chemical reactions?……
……

6 - Put (√) or (x) then correct the false statement :

1. The number of **electrons** in the **negative ion** is less than that of **its atom** (….)
2. The number of **energy levels** in the **negative ion** is less than that of **its atom** (….)
3. **Bromine** is from metalloid elements (….)

7 – Choose the correct answer :

1. The **difference** between sodium **atom** ($_{11}Na$) and sodium **ion** (Na^+) is number of…
   a. protons
   b. electrons
   c. energy levels
   d. (b) and (c)

2. **An elemen**t (Y), its **atomic number** is 17, so electronic configuration of its **ion** is..
   a. 2,8,7
   b. 2,8,8
   c. 2,8,8,7
   d. 2,8,1

3. The **nucleus** of X^{-2} ion is **surrounded by** 10 **electrons** revolve around it and the **mass number** of this **ion** equals 16, so the **number** of **electrons** in the X **atom** is……..and the **number** of its **neutrons** is…………….
   a. 8, 8
   b. 8, 16
   c. 18, 21
   d. 16, 16

8 – Answer the following questions :

1. Which of the following figures **represents** :

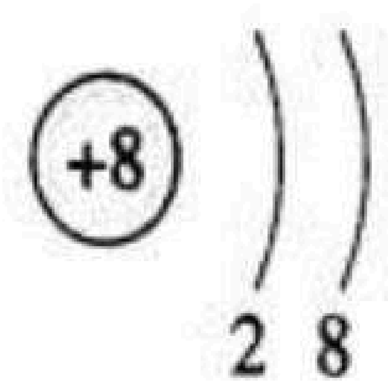


Fig. (A)

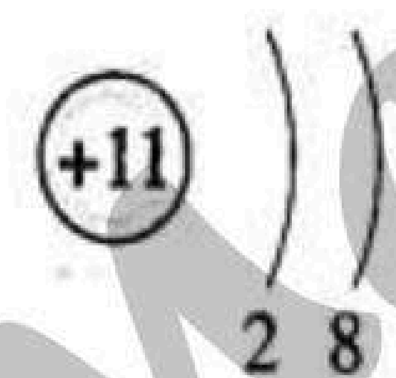


Fig. (B)

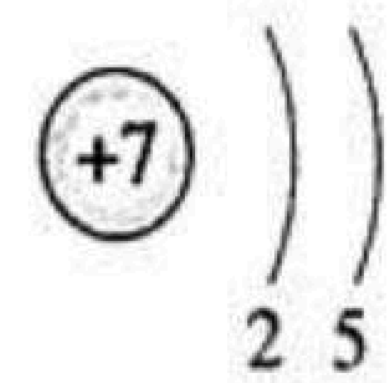
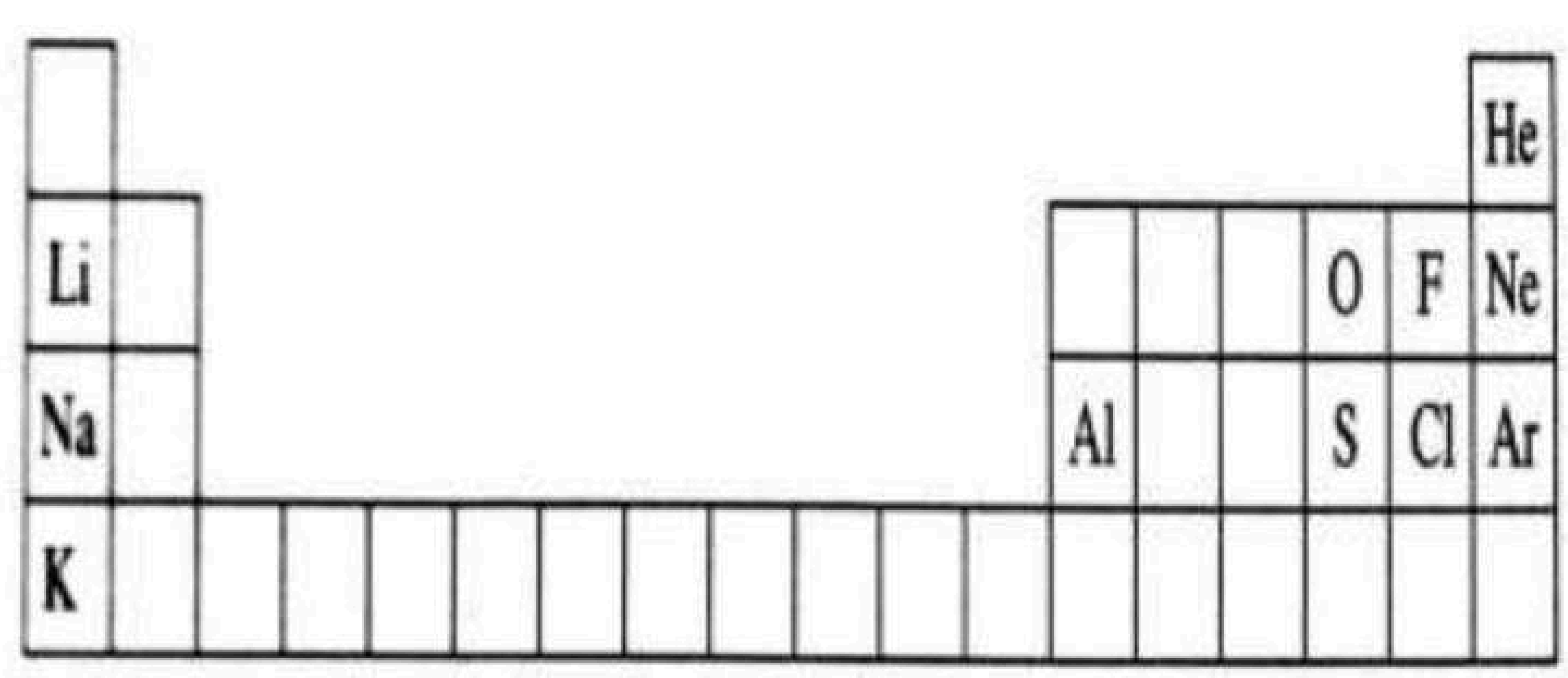


Fig. (C)

   a. **A positive** ion (…………………………..)
   b. **A neutral** atom (…………………………..)
   c. **A negative** ion (…………………………..)

2. **Trivalent nonmetallic** element located in the 3rd **period** whose **nucleus** contains 16 **neutrons**. So, its **atomic number** is…………………..and its **mass number** is……….

3. **Look at** the opposite figure, then **answer** the following questions :
   a. **A nonmetal**, whose **ion** electronic structure is **similar to** that of **Ar** element? (………….)
   b. **A metal**, whose **ion** electronic structure is **similar to** that of of **Ne** element? (………….)



THANK YOU

2nd Preparatory – First Term - Lesson 2 – Part 4 (.... / 20)

1 - Write the definition of each of the following :

1. Metalloids (semi-metals) :...
   ....

2 - Write the scientific term for each of the following :

1. **A group** which contains the strongest **metals** (..................)
2. **A group** which contains the strongest **non-metals** (..................)
3. The **strongest (most) metallic element** in group (1A) (..................)
4. The **least metallic element** in group (1A) (..................)

3 - Complete the following statements :

1. Each period in the modern periodic table **starts** with.............and **ends** with...........
2. By **increasing** the **atomic number** within a **period**, the **metallic** property..........., while the **nonmetallic** property..............
3. The **most metallic element** in **group** (1A) lies at the................., while the **least metallic element** lies at the................of the **group**
4. By **increasing** the **atomic number** in **group** (1A), the **metallic** property.............
5. By **increasing** the **atomic number** in **group** (7A), the **nonmetallic** property.........

4 - Give reason for each of the following :

1. **Nonmetallic** property of oxygen ($_8O$) is more than that of nitrogen ($_7N$)?...............
   ....
2. **Metallic** property of potassium ($_{19}K$) is more than that of sodium ($_{11}Na$)?.................
   ....
3. The **nonmetallic** property decreases from top to bottom as in group (7A)?.............
   ....

5 – What happens when :

1. We go from **up** to **down** inside the group (1A)?...
   ....

2. We go from **up** to **down** inside the group (7A)?..
....

6 - Put (√) or (x) then correct the false statement :

1. **Cesium** is the strongest metal in the modern periodic table (............)
2. **Fluorine** is the strongest nonmetal in the modern periodic table (............)

7 – Choose the correct answer :

1. By **increasing** the **atomic number** within **group** (1A), the.........................

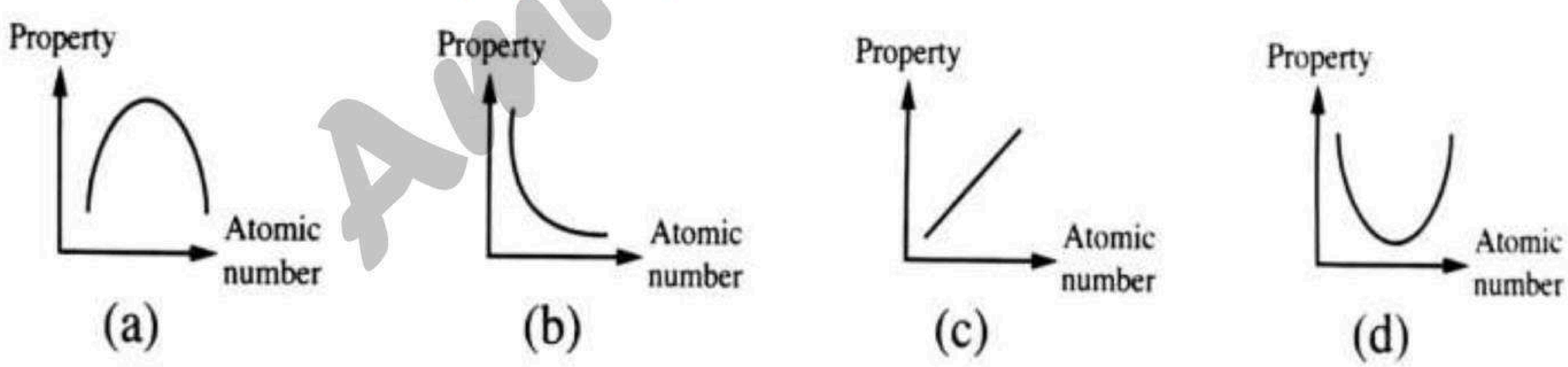
a. atomic size decreases
b. metallic property increases
c. nonmetallic property increases
d. all the previous answers

8 – Answer the following questions :

1. **Three elements** $_{3}$**X**, $_{9}$**Y** and $_{11}$**Z**. Which of these elements has

The **smallest** atomic **size**? (....................)
The **largest** atomic **size**? (....................)
c. The **largest metallic** property? (....................)

2. Which of the following figures **represents** :



a. Graduation of **atomic size** within **group** (3)? (....................)
b. Graduation of **atomic size** within **period** (2)? (....................)
c. Graduation of **metallic property** in **group** (1A)? (....................)
d. Graduation of **nonmetallic property** in **group** (7A)? (....................)

THANK YOU

2nd Preparatory – First Term - Lesson 2 – Part 5 (…. / 25)

1 - Write the definition of each of the following :

1. Chemical activity series :……………………………………………………………………………………
………

2 - Write the scientific term for each of the following :

1. **Substance** results from dissolving of **metal oxides** in **water** (………………)
2. **Substances** resulted from dissolving **nonmetal oxides** in **water** (………………)

3 - Complete the following statements :

1. When **magnesium** reacts with **dilute hydrochloric acid**,……………..**salt** is formed and…………….**gas** evolves which burns with…………..**sound**
2. When **a magnesium** strip is **burned** in the **presence** of **oxygen**,…………..**powder** is formed which is……………….**oxide**
3. ………….and………….are **metals** that react **very slowly** with **cold water**, while……..and…………...metals react with **hot water vapour** at **high temperatures** only
4. When **a piece of coal** (**carbon**) is burned in the **presence** of **oxygen**,………………… is formed which is……………….**oxide**
5. Some **metal oxides** as…………..are known as **amphoteric oxides**, as they react with **acids** as **a base** and also reacts with **a base** as **an acid** giving ……..and…………

4 - Give reason for each of the following :

1. We can use **water** to differentiate between **calcium** and **zinc**?……………………………
………
2. We can use **dilute HCl** to differentiate between **carbon** and **magnesium**?…………
………

5 – What happens when : - With balanced symbolic equation -

1. Dissolving **magnesium oxide** in **water**?…………………………………………………………
………
2. Dissolving **carbon dioxide** in **water**?……………………………………………………………
………

6 – Complete the following chemical equations :

1. $Zn + 2HCl \xrightarrow{Dilute}$ .... + ...   2. $C + O_2 \xrightarrow{\Delta}$ ....

7 - Put (√) or (x) then correct the false statement :

1. **Sodium oxide** (Na_2O) is **a basic** oxide (...........)
2. **Sulphur trioxide** (SO_3) is **an acidic** oxide (...........)
3. **Al_2O_3** is from **amphoteric** oxides (...........)

8 – Choose the correct answer :

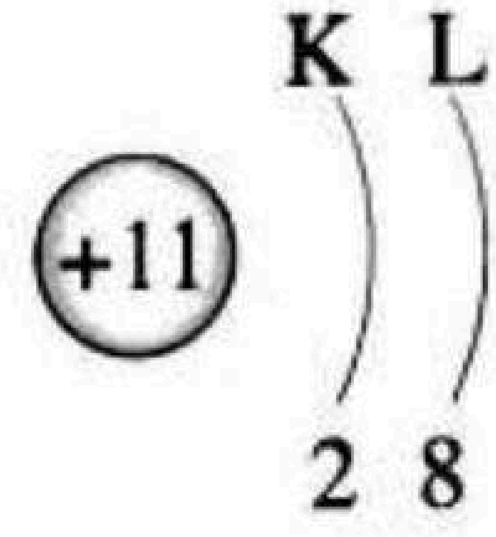
1. Which of the following metals **react** with **dilute hydrochloric acid**?...........
   a. Cu   b. Zn   c. C
2. When **sodium** or **potassium** reacts with **water**,................**gas** evolves
   a. O_2 b. H_2 c. CO_2
3. The **oxides** of the 3rd **period** elements are as the following.....................
   a. acidic, amphoteric then basic
   b. acidic, basic then amphoteric
   c. basic, amphoteric then acidic
   d. basic, acidic then amphoteric

9 – Complete the following table :

1. Complete the following table :

Element	Electronic configuration	It kind	*Formula* of oxide	*Type* of oxide
$_{16}S$	....	....	....	....

2. The figure shows the **electronic distribution** of *an ion* of **an element**. **Find**
   a. The **atomic number** of the **atom** of this element?...............
   b. Which **block** does it belong to?..............................
   c. The **position** of the **element** in the periodic table?.....................
   d. The **nearest** inert gas for this element?.............................
   e. The **type** of **oxide** of this element? ....



THANK YOU

Worksheet 1 [Lesson 1]

[1] – Complete the following:

1 – The most important attempts to classify elements are ------------------------,--------------------and -------------------.

2 – In 1913, the New Zealand scientist -------------------discovered that the nucleus of the atom contains ----------------.

3 – The modern periodic table consists of -----Periods& ------ groups.

4 – Elements of p-block are located on the -------side of the periodic table and they are arranged in -----------groups.

5 – Element $_{13}X$ lies in period ----------- and group -------.

6 – In the modern periodic table, f-block includes ----------- and ---------------which are located below the table.

7 – Elements of B are called ------------ elements and they start from period ------------------.

8. Mendeleev arranged the elements ascendingly according to ---------, while Mosely arranged them ascendingly according to ---------------.

[2] Locate the position of the following elements in the modern periodic table:

1 – $_{7}N$

----

2 – $_{17}Cl$

----

3 – $_{6}C$ 4 – $_{10}Ne$

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[3] The following figure is for one of the periods of the modern periodic table. The symbols X, Y, and Z do not represent the real symbols of these elements answer the following:

X	$_{12}Mg$	Al	Si	P	Y	Z	$_{18}Ar$

A – Locate the position of element X and Y in the periodic table.

B – Mention the kind of elements X and Z.

<u>[4] What is the scientific principle upon which the elements are arranged in:</u>

1 – Modern periodic table

<u>[5] Complete the table:</u>

Element	**$_{20}$ Ca**	**$_{15}$ P**	**$_{10}$ Ne**
Electron configuration			
Energy levels			
Number of period			
No. of electrons in outer energy level			
No. of group			

Worksheet 2[Lesson 1]

Question (1):

A)-Complete the following statements:

1)-One of the advantages of Mendeleev's table is correcting the wrongly estimated ----------- of some elements.

2)-Mendeleev arranged the elements ascending according to ---------, while Moseley arranged them ascending according to ----------.

3)-Moseley located ------- and -------- elements below its table.

4)-Mendeleev discovered that the mass number (weight) of elements increase on moving from --------- side of the table to the -------- side in horizontal rows which were known later as ---------.

B)-Choose the correct answer:

1)-The number of elements in Mendeleev's periodic table is ------ elements. (92 – 116 -76 – 67)

2)-Elements are arranged in Moseley's periodic table in ascending order according to --------------.

(mass number – atomic number – valency)

3)-The nucleus of the atom contains ----------.

(positive electrons – negative protons – positive protons)

4)-The periodic table consists of ---------- horizontal periods.

(7 – 10 – 14 – 18)

5)-The periodic table consists of ----------- vertical groups.

(7 – 10 – 18 – 14)

Question (2):

A)-Write the scientific term:

1)-The table in which elements are arranged according to their atomic weight (mass). (---------------)

2)-Elements found below the periodic table. (---------------)

3)-The table in which elements are arranged according to their atomic number. (---------------)

4)-Elements of group zero (0). (---------------)

B)-Variant questions:

1)-Who predicated the discovery of new elements and determined their atomic mass. -------------------------

2)-Who added inert gases to the zero (0) group.

Worksheet 3 [Lesson 2]

[1] – Complete the following:

1 – The ability of an atom in the covalent compound to attract the bonded electrons to itself is called the ------------------.

2 – Water& Ammonia are from -----------------compound.

3 – The descending arrangement of elements according to their chemical activities is called -----------------.

4 – The ----------- & ------------ increase by increasing the atomic number in the same group, while -----------decreases by increasing the atomic number.

5 - -------------- and ------------ are examples of non-polar compound.

[2] What is meant by:

1 – Electro negativity

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2 – Metalloid

---

[3] Give reasons:

1 – Water molecule is from polar compounds.

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2 – The atomic size of $_{11}Na$ is greater than that of $_{3}Li$.

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[4] Choose the correct answer:

1. When sodium reacts with water ------------gas evolves.

   (O_2 - CO_2 - H_2 - N_2)

2. Each period in the modern periodic table starts with --------- element.

   (metallic – semi metallic – nonmetallic – inert)

3. Inside the same period, the element which has high electronegativity lies in group ------------.

   (0 - 7A – 2A – 1A)

[5] Write the balanced chemical equation which expresses the reaction of:

1. Carbon dioxide with water.

   ----

2. Magnesium with dilute Hydrochloric acid.

   ----

3. Magnesium oxide with water.

   ----

4. Carbon with oxygen.

Worksheet 4 [Lesson 2]

[1] – Complete the following:

1 - --------------have the properties of both metals and non-metals.

2 – By increasing the atomic number within group 1A, the metallic property ------------------.

3 - -------------is the strongest nonmetal element in group 7A.

4 - -------------is the least metallic element in group 1A.

5 – The nonmetallic atoms tend to ------------electrons and change into -------------------.

6 – Each period starts with strong --------------- and the ---------- decreases by increasing the atomic number.

[2] Compare between:

1 – Positive ion and negative ion.

2 – The metallic property in the group and in the period

Worksheet 5 [Lesson 2]

Question (1):

A)-Complete the following statements:

1)-By increasing the atomic number in periods, the atomic size ------due to the -------- force between positive nucleus and the outermost electrons increases.

2)-The atomic size of lithium ($_3Li$) atom is -------- than that of nitrogen ($_7N$) atom and -------- than that of sodium ($_{11}Na$).

3)-The outermost energy level of metals contains ------- 4 electrons, while that of ------- contains more than 4 electrons.

4)-During the chemical reaction, magnesium ($_{12}Mg$) atom loses ------ electrons and changes into ------- ion which carries ------- positive charges.

5)-In water molecule, the electro negativity of oxygen is (3.5) but the electro negativity of hydrogen is (2.1) , the ------atom attracts the electrons of the bond more than ------- atom as it has higher ------.

6)- --------- element has the highest electro negativity in the periodic table which equals -----------.

7)-Metal oxides are called -------- oxides, while non- metal oxides are called --------- oxides.

B)-Choose the correct answer:

1)-Which of the following elements is a metallic element?

($_{12}Mg$ – $_{17}Cl$ – $_8O$ – $_{10}Ne$)

2)-The electronic configuration of magnesium ion (Mg^{+2}) is similar to all the following except --------.

(Na^{+} – $_{10}Ne$- Al^{+3} – $_{18}Ar$)

3)------- is the least metallic element in group 1A.

(Na – Cs- K –Li)

4)-All the following metals react with water except--------.

(Na – K –Mg – Cu)

5)-Acids are formed when -------- oxides dissolve in water.

(non metal – metal – amphoteric)

6)-Magnesium reacts with oxygen giving ---------.

($MgCl_2$-MgO-$MgSO_4$)

7)-All the following elements are metalloids except--------.

(thallium(Ti) – Silicon (Si) –boron (B) – bromine (Br))

Question (2):

A)-Complete the following chemical equations:

1)-$2\,Mg + O_2 \Rightarrow$

2)-$Mg + HCl \Rightarrow$

3)-$C + O_2 \Rightarrow$

4)-$MgO + H_2O \Rightarrow$

5)-$CO_2 + H_2O \Rightarrow$

B)-Give reason for:

1)-In periods, by increasing the atomic number, the atomic size decreases.

--.

2)-Solution of carbon dioxide in water turns the blue litmus paper into red.

--.

3)-Water is more polar than ammonia. (Knowing that the difference of the electro negativity in water =1.2 & Ammonia = 0.9).

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